

| Ques | Working | Answer | Mark | Notes |
|---------------|--|--------|------|--|
| | $4 \times 1.25 (=5)$ or $2 \times 2.90 (=5.8(0))$ | | 3 | M1 For a correct method to find the total cost of the 4 cans of cola or the 2 sandwiches |
| | $20 - (4 \times 1.25 + 2 \times 2.90)$ | 9.2(0) | | M1 For fully correct method to find the change |
| | | | | A1 If no marks awarded, SCB1 For 15.85 |
| Total 3 marks | | | | |

Q2.

| Question | Working | Answer | Mark | Notes |
|----------|---|--------|------|--------|
| | $150 \div 6 (=25)$ or $6 \times 25 = 150$ or $1.03 \div 6 (=0.17...)$ "25" $\times 1.03$ or "0.17..." $\times 150$ | | | M1 |
| | | 25.75 | 3 | M1 dep |
| | | | | A1 |

Q3.

For all questions, the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

| | Working | Answer | Mark | Notes |
|---------------|---|--------|------|---|
| (a) | $25 \times 17.5(0) (= 437.5(0))$ or 437 or 438 | | 3 | M1 |
| | "437.5" $\div 50 (= 8.75)$ or 50×9 or 50×8 | | | M1 dep |
| | | 9 | | A1 |
| (b) | "9" $\times 50 - "437.50"$ oe or $50 - ("437.5" - 400)$ oe | | 2 | M1 for a complete method ; only ft from an integer answer to (a) |
| | | 12.50 | | A1 ft providing answer is positive. Accept 12.5 |
| Total 5 marks | | | | |

1 Work out $5 - 9$

-4

(Total for Question 1 is 1 mark)

2 Work out $-7 + 4$

-3

(Total for Question 2 is 1 mark)

3 Work out $-8 - 10$

-18

(Total for Question 3 is 1 mark)

4 Work out $-2 + -11$

-13

(Total for Question 4 is 1 mark)

5 Work out $7 - -9$

16

(Total for Question 5 is 1 mark)

6 Work out $-5 - -12$

7

(Total for Question 6 is 1 mark)

7 Work out $-5 + 8$

3

(Total for Question 7 is 1 mark)

8 Work out $16 - -4$

20

(Total for Question 8 is 1 mark)

- 9 Here are four numbers.

-5 -4 4 ~~5~~

Write one of these numbers in each box to make a correct calculation.

$$\begin{array}{l} \boxed{-5} + \boxed{-4} = -9 \\ \text{OR} \quad \boxed{-4} + \boxed{-5} \end{array}$$

(Total for Question 9 is 1 mark)

- 10 Here are four numbers.

-7 -2 2 7

Write one of these numbers in each box to make a correct calculation.

$$\begin{array}{l} \boxed{2} + \boxed{-7} = -5 \\ \text{OR} \quad \boxed{-7} + \boxed{2} \end{array}$$

(Total for Question 10 is 1 mark)

- 11 Here are four numbers.

-8 -2 2 8

Write one of these numbers in each box to make a correct calculation.

$$\begin{array}{l} \boxed{-8} - \boxed{2} = -10 \\ \text{OR} \quad \boxed{-2} - \boxed{8} \end{array}$$

(Total for Question 11 is 1 mark)

- 12 Here are four numbers.

-9 -3 3 9

Write one of these numbers in each box to make a correct calculation.

$$\begin{array}{l} \boxed{9} - \boxed{-3} = 12 \\ \text{OR} \quad \begin{array}{r} 3 \\ \boxed{3} - \boxed{-9} \end{array} \end{array}$$

(Total for Question 12 is 1 mark)

13 Work out 5×-4

-20

(Total for Question 13 is 1 mark)

14 Work out -7×3

-21

(Total for Question 14 is 1 mark)

15 Work out -2×-6

12

(Total for Question 15 is 1 mark)

16 Work out -4×9

-36

(Total for Question 16 is 1 mark)

17 Work out $-32 \div 4$

-8

(Total for Question 17 is 1 mark)

18 Work out $-25 \div 5$

-5

(Total for Question 18 is 1 mark)

19 Work out $-42 \div -7$

6

(Total for Question 19 is 1 mark)

20 Work out $-2 \times 4 \times -9$

-8×-9

72

(Total for Question 20 is 1 mark)

21

$$\boxed{4} \times \boxed{-3} = \boxed{-12}$$

Write a number in the box to make a correct calculation.

(Total for Question 21 is 1 mark)

22

$$\boxed{-10} \times \boxed{2} = \boxed{-20}$$

Write a number in the box to make a correct calculation.

(Total for Question 22 is 1 mark)

23

$$\boxed{-6} \times \boxed{-4} = \boxed{24}$$

Write a number in the box to make a correct calculation.

(Total for Question 23 is 1 mark)

24

$$\boxed{-2} \times \boxed{8} = \boxed{-16}$$

Write a number in the box to make a correct calculation.

(Total for Question 24 is 1 mark)

25

$$\boxed{-18} \div \boxed{-2} = \boxed{9}$$

Write a number in the box to make a correct calculation.

(Total for Question 25 is 1 mark)

26

$$\boxed{27} \div \boxed{-3} = \boxed{-9}$$

Write a number in the box to make a correct calculation.

(Total for Question 26 is 1 mark)

27 Here is a number sequence.

| | | | | |
|----|---|---|----|----|
| 11 | 6 | 1 | -4 | -9 |
|----|---|---|----|----|

Fill in the missing boxes to continue the sequence.

(Total for Question 27 is 2 marks)

28 Here is a number sequence.

| | | | | |
|-----|-----|----|---|----|
| -20 | -12 | -4 | 4 | 12 |
|-----|-----|----|---|----|

Fill in the missing boxes to continue the sequence.

(Total for Question 28 is 2 marks)

29 Here is a number sequence.

| | | | | |
|-----|----|----|---|---|
| -11 | -7 | -3 | 1 | 5 |
|-----|----|----|---|---|

Fill in the missing boxes to complete the sequence.

(Total for Question 29 is 2 marks)

30 Here is a number sequence.

| | | | | |
|----|----|----|-----|-----|
| 25 | 10 | -5 | -20 | -35 |
|----|----|----|-----|-----|

Fill in the missing boxes to complete the sequence.

(Total for Question 30 is 2 marks)

- 31 The temperature in Glasgow one day was -4°C .
The next day the temperature was 3°C lower.

Work out the new temperature.

 -7 $^{\circ}\text{C}$

(Total for Question 31 is 1 mark)

- 32 The temperature in London at midnight was -3°C .
By 11 am, the temperature had risen by 5°C .

Work out the temperature at 11 am.

 2 $^{\circ}\text{C}$

(Total for Question 32 is 1 mark)

- 33 The temperature in Leeming at midnight was -2°C .
The temperature in Leeming at midday was 8°C .

Work out the difference between the temperature in Leeming at midnight and midday.

 10 $^{\circ}\text{C}$

(Total for Question 33 is 1 mark)

- 34 The table shows the temperature in four cities on a day in January.

| City | Temperature |
|----------|----------------------|
| London | 3°C |
| New York | -2°C |
| Tokyo | 5°C |
| Oslo | -4°C |

- (a) Write down the name of the city with the lowest temperature.

 Oslo
(1)

- (b) Work out the difference between the temperature in New York and the temperature in Tokyo.

 7 $^{\circ}\text{C}$
(1)

The next day the temperature in New York increased by 3°C .

- (c) Work out the new temperature in New York.

 1 $^{\circ}\text{C}$
(1)

(Total for Question 34 is 3 marks)

- 35 The table shows the temperature at midnight and midday on January 2nd 2020 in four cities.

| City | Midnight Temperature | Midday Temperature |
|----------|----------------------|--------------------|
| Murmansk | -9 °C | -6 °C |
| Budapest | -3 °C | 4 °C |
| Paris | 4 °C | 8 °C |
| Prague | -4 °C | 1 °C |

- (a) Write down the name of the city with the lowest midnight temperature.

Murmansk
(1)

- (b) Which city had the greatest rise in temperature from midnight to midday?

Budapest
(1)

- (c) At midnight, how many degrees colder was Murmansk than Paris?

13 °C
(1)

(Total for Question 35 is 3 marks)

- 36 The table shows the temperature at midnight on 1 December 2019 in cities.

| City | Temperature |
|----------|-------------|
| Helsinki | -6 °C |
| Berlin | 3 °C |
| Utrecht | -2 °C |
| Rome | 7 °C |

- (a) Write down the name of the city with the lowest temperature.

Helsinki
(1)

- (b) Work out the difference between the temperature in Utrecht and Rome.

9 °C
(1)

(Total for Question 36 is 2 marks)

- 13 Write $\frac{3}{50}$ as a percentage.

$$\frac{3}{50} = \frac{6}{100}$$

6 %

(Total for Question 13 is 1 mark)

- 14 Write 0.06 as a percentage.

$$0.06 \times 100$$

6 %

(Total for Question 14 is 1 mark)

- 15 Write 0.11 as a fraction.

$$\frac{11}{100}$$

(Total for Question 15 is 1 mark)

- 16 Write 0.9 as a percentage.

$$0.9 \times 100$$

90 %

(Total for Question 16 is 1 mark)

- 17 Write 0.19 as a percentage.

$$0.19 \times 100$$

19 %

(Total for Question 17 is 1 mark)

- 18 Write 0.025 as a fraction.

$$\frac{25}{1000} \text{ or } \frac{5}{200} \text{ or } \frac{1}{40}$$

$$\frac{25}{1000}$$

any equivalent

(Total for Question 18 is 1 mark)

- 19 Write $\frac{12}{100}$ as a decimal.

$$12 \div 100$$

0.12

(Total for Question 19 is 1 mark)

- 20 Write $\frac{7}{10}$ as a decimal.

$$7 \div 10$$

0.7

(Total for Question 20 is 1 mark)

- 21 Write 0.003 as a fraction.

$$\frac{3}{1000}$$

(Total for Question 21 is 1 mark)

- 22 Write 0.3 as a percentage.

$$0.3 \times 100$$

30

%

(Total for Question 23 is 1 mark)

- 23 Write $\frac{9}{20}$ as a percentage.

$$\frac{9}{20} = \frac{45}{100}$$

45

%

(Total for Question 23 is 1 mark)

- 24 Write 0.06 as a fraction.

$$\frac{6}{100}$$

(Total for Question 24 is 1 mark)

- 25 Dèan says that 13% is greater than 0.1

Is Dean correct?

Give a reason for your answer.

YES : either $13\% = 0.13$ and $0.13 > 0.1$

or $0.1 = 10\%$ and $13\% > 10\%$

(Total for Question 25 is 1 mark)

- 26 Tom and Jerry both earn the same monthly salary.

Each month:

Tom saves 35% of his salary.

Jerry spends $\frac{3}{5}$ of his salary and saves the rest of his salary.

Work out who saves the most money each month.

You must show your working.

Jerry saves $\frac{2}{5} = 40\%$

$40\% > 35\%$

Jerry saves more money.

(Total for Question 26 is 2 marks)

- 27 Write the following numbers in order of size.
Start with the smallest number.

75% $\frac{7}{10}$ 0.72 0.9 $\frac{4}{5}$
0.75 0.7 0.8

$\frac{7}{10}$ 0.72 75% $\frac{4}{5}$ 0.9

(Total for Question 27 is 2 marks)

- 28 Write the following numbers in order of size.
Start with the smallest number.

0.3 $\frac{1}{3}$ 21% $\frac{1}{4}$ 0.205
30% 33.3% 25% 20.5%

0.205 21% $\frac{1}{4}$ 0.3 $\frac{1}{3}$

(Total for Question 28 is 2 marks)

- 1 Find $\frac{1}{6}$ of 420

$$\frac{420}{6} = 70$$

70

(Total for question 1 is 1 mark)

- 2 Find $\frac{1}{4}$ of 44

$$\frac{44}{4} = 11$$

11

(Total for question 2 is 1 mark)

- 3 Find $\frac{1}{8}$ of 72

$$\frac{72}{8} = 9$$

9

(Total for question 3 is 1 mark)

- 4 Find $\frac{1}{5}$ of 60

$$\frac{60}{5} = 12$$

12

(Total for question 4 is 1 mark)

- 5 Find $\frac{1}{3}$ of 48

$$\frac{48}{3} = 16$$

(Total for question 5 is 1 mark)

6 Work out $\frac{3}{4}$ of 180

$$\frac{1}{4} \text{ of } 180 = \frac{180}{4} = 45$$

$$\frac{3}{4} \text{ of } 180 = 45 \times 3 = 135$$

.....135

(Total for question 6 is 2 marks)

7 Work out $\frac{2}{5}$ of 140

$$\frac{1}{5} \text{ of } 140 = \frac{140}{5} = 28$$

$$\frac{2}{5} \text{ of } 140 = 28 \times 2 = 56$$

.....56

(Total for question 7 is 2 marks)

8 Find $\frac{2}{3}$ of 240

$$\frac{1}{3} \text{ of } 240 = \frac{240}{3} = 80$$

$$\frac{2}{3} \text{ of } 240 = 80 \times 2 = 160$$

.....160

(Total for question 8 is 2 marks)

9 Find $\frac{5}{6}$ of 72

$$\frac{1}{6} \text{ of } 72 = \frac{72}{6} = 12$$

$$\frac{5}{6} \text{ of } 72 = 12 \times 5 = 60$$

.....60

(Total for question 9 is 2 marks)

10 Work out $\frac{3}{7}$ of 56

$$\frac{1}{7} \text{ of } 56 = \frac{56}{7} = 8$$

$$\frac{3}{7} \text{ of } 56 = 8 \times 3 = 24$$

.....24

(Total for question 10 is 2 marks)

- 11 Holly is thinking of a number.

$\frac{3}{4}$ of Holly's number is 39.

Work out the number Holly is thinking of.

$$\frac{3}{4} \text{ of } n = 39$$

$$\frac{1}{4} \text{ of } n = \frac{39}{3} = 13$$

$$n = 13 \times 4 = 52$$

.....52

(Total for question 11 is 2 marks)

- 12 $\frac{2}{5}$ of number n is 18.

Find the value of n .

$$\frac{1}{5} \text{ of } n = \frac{18}{2} = 9$$

$$n = 9 \times 5 = 45$$

.....45

(Total for question 12 is 2 marks)

- 13 $\frac{5}{6}$ of number is 30.

Find the number.

$$\frac{1}{6} \text{ of } n = \frac{30}{5} = 6$$

$$n = 6 \times 6 = 36$$

.....36

(Total for question 13 is 2 marks)

- 14 Work out the difference between 25 and $\frac{2}{9}$ of 81

$$81 \div 9 = 9$$

$$\frac{1}{9} \text{ of } 81 = 9$$

$$\frac{2}{9} \text{ of } 81 = 18$$

$$25 - 18 = 7$$

7

(Total for question 14 is 3 marks)

- 15 Work out the difference between $\frac{3}{8}$ of 32 and $\frac{2}{5}$ of 40

$$\frac{3}{8} \text{ of } 32$$

$$32 \div 8 = 4$$

$$3 \times 4 = 12$$

$$\frac{2}{5} \text{ of } 40$$

$$\frac{40}{5} = 8$$

$$2 \times 8 = 16$$

$$16 - 12 = 4$$

4

(Total for question 15 is 3 marks)

- 16 Work out the difference between 20% of 90 and $\frac{3}{7}$ of 49

$$20\% \text{ of } 90$$

$$10\% = 9 \quad [90 \div 10]$$

$$20\% = 18 \quad [9 \times 2]$$

$$\frac{49}{7} = 7$$

$$\frac{1}{7} \text{ of } 49 = 7$$

$$7 \times 3 = 21$$

$$\frac{3}{7} \text{ of } 49 = 21$$

$$21 - 18 = 3$$

3

(Total for question 16 is 3 marks)

- 17 There are 924 people in a theatre.

383 of the people are men.

356 of the people are women.

$\frac{2}{5}$ of the children are boys.

Work out how many girls are in the theatre.

$$\begin{array}{r} 383 \\ + 356 \\ \hline 739 \end{array}$$

Adults

$$\begin{array}{r} 924 \\ - 739 \\ \hline 185 \end{array}$$

Children

$$5 \overline{) 185} \begin{array}{l} 37 \end{array}$$

$$\frac{1}{5} \text{ of } 185 = 37$$

$$37 \times 3 = 111$$

$$\frac{3}{5} \text{ of } 185 = 111$$

111

(Total for question 17 is 3 marks)

- 18 The normal price of a computer game is £40

The price is reduced by $\frac{1}{5}$ in a sale.

Work out the price of the computer game in the sale.

$$\frac{40}{5} = 8$$

$$40 - 8 = 32$$

£32

(Total for question 18 is 2 marks)

- 19 There are 1100 students at a school.

540 students are girls, the rest are boys.

$\frac{1}{10}$ of the girls are left handed.

$\frac{1}{8}$ of the boys are left handed.

Work out the number of left handed students in the school.

$$1100 - 540 = 560 \quad (560 \text{ Boys})$$

$$\frac{1}{10} \text{ of } 540 = \frac{540}{10} = 54$$

$$\frac{1}{8} \text{ of } 560 = \frac{560}{8} = \frac{280}{4} = \frac{140}{2} = 70$$

$$54 + 70 = 124$$

.....124.....

(Total for question 19 is 3 marks)

- 20 Harry has 50 sweets.

He gives $\frac{2}{5}$ of the sweets to Sandra.

He gives $\frac{3}{10}$ of the sweets to Jamie.

Harry keeps the rest of the sweets for himself.

Work out how many sweets Harry keeps.

$$\frac{1}{5} \text{ of } 50 = \frac{50}{5} = 10$$

$$\frac{2}{5} \text{ of } 50 = 10 \times 2 = \underline{\underline{20}}$$

$$\frac{1}{10} \text{ of } 50 = \frac{50}{10} = 5$$

$$\frac{3}{10} \text{ of } 50 = 3 \times 5 = \underline{\underline{15}}$$

He gives away

$$20 + 15 = 35$$

$$50 - 35 = \underline{\underline{15}}$$

.....15.....

(Total for question 20 is 3 marks)

- 21 The normal price of a train ticket from Ashford to London is £34.20

Ross gets $\frac{1}{3}$ off the price of his train ticket

Work out how much Ross pays for his ticket.

$$\frac{1}{3} \text{ of } 34.20 = \frac{34.20}{3}$$

$$\begin{array}{r} 1140 \\ 3 \overline{) 3420} \end{array}$$

$$= 11.40$$

$$\begin{array}{r} 34.20 \\ - 11.40 \\ \hline 22.80 \end{array}$$

£ 22.80

(Total for question 21 is 2 marks)

- 22 Stan has an income of £2000 a month.

He spends $\frac{2}{5}$ of his income on rent.

$$\frac{1}{5} \text{ of } 2000 = \frac{2000}{5} = 400$$

He spends $\frac{3}{20}$ of his income on bills.

$$\frac{2}{5} \text{ of } 2000 = 2 \times 400 = \underline{\underline{800}}$$

He spends $\frac{1}{10}$ of his income on food.

$$\frac{1}{20} \text{ of } 2000 = \frac{2000}{20} = 100$$

Stan saves the rest of his income.

$$\frac{3}{20} \text{ of } 2000 = 100 \times 3 = \underline{\underline{300}}$$

Work out how much Stan saves each month.

$$\frac{1}{10} \text{ of } 2000 = \frac{2000}{10} = \underline{\underline{200}}$$

$$\text{Stan spends: } 800 + 200 + 300 = 1300$$

$$\text{Stan saves: } 2000 - 1300 = 700$$

£ 700

(Total for question 22 is 3 marks)

1 Work out $\frac{1}{10} + \frac{3}{5}$

$$\frac{1}{10} + \frac{6}{10}$$

$$\frac{7}{10}$$

(Total for question 1 is 2 marks)

2 (a) Work out $\frac{2}{3} - \frac{1}{4}$

$$4 \times \frac{2}{3} - \frac{1}{4} \times 3$$

$$\frac{8}{12} - \frac{3}{12}$$

$$\frac{5}{12}$$

(2)

(b) Work out $\frac{3}{4} \times \frac{4}{9}$

Give your answer as a fraction in its simplest form.

$$\frac{12}{36} = \frac{1}{3}$$

$$\frac{1}{3}$$

(2)

(Total for question 2 is 4 marks)

3

Work out $\frac{3}{4} \times \frac{5}{6}$

$$\frac{15}{24} = \frac{5}{8}$$

$$\frac{5}{8}$$

(Total for question 3 is 2 marks)

4

(a) Work out $\frac{1}{5} + \frac{3}{4}$

$$4 \times \frac{1}{5} + \frac{3 \times 5}{4 \times 5}$$

$$\frac{4}{20} + \frac{15}{20}$$

$$\frac{19}{20}$$

(2)

(b) Work out $\frac{4}{5} - \frac{1}{3}$

$$3 \times \frac{4}{5} - \frac{1 \times 5}{3 \times 5}$$

$$\frac{12}{15} - \frac{5}{15}$$

$$\frac{7}{15}$$

(2)

(Total for question 4 is 4 marks)

5 Work out $\frac{3}{4} + \frac{1}{12}$

$$\begin{array}{l} \times 3 \\ \times 3 \end{array} \frac{3}{4} + \frac{1}{12}$$

$$\frac{9}{12} + \frac{1}{12} = \frac{10}{12} = \frac{5}{6}$$

$$\frac{5}{6}$$

(Total for question 5 is 2 marks)

6 (a) Work out $\frac{4}{9} + \frac{3}{5}$

$$\begin{array}{l} 5 \times \\ 5 \times \end{array} \frac{4}{9} + \frac{3}{5} \times 9$$

$$\frac{20}{45} + \frac{27}{45} = \frac{47}{45} \quad \text{or} \quad 1 \frac{2}{45}$$

$$\frac{47}{45}$$

(2)

(b) Work out $\frac{3}{5} \div \frac{3}{8}$

Give your answer as a mixed number in its simplest form.

$$\frac{3}{5} \times \frac{8}{3} = \frac{24}{15} = \frac{8}{5} = 1 \frac{3}{5}$$

$$1 \frac{3}{5}$$

(2)

(Total for question 6 is 4 marks)

7

Work out $\frac{1}{7} \div \frac{3}{4}$

$$\frac{1}{7} \times \frac{4}{3} = \frac{4}{21}$$

$$\frac{4}{21}$$

(Total for question 7 is 2 marks)

8

(a) Work out $\frac{5}{6} - \frac{1}{7}$

$$\begin{array}{r} 7 \times \frac{5}{6} - \frac{1 \times 6}{7 \times 6} \end{array}$$

$$\frac{35}{42} - \frac{6}{42} = \frac{29}{42}$$

$$\frac{29}{42}$$

(2)

(b) Work out $1\frac{3}{4} \times 1\frac{1}{2}$

Give your answer as a mixed number in its simplest form.

$$\frac{7}{4} \times \frac{3}{2} = \frac{21}{8} = 2\frac{5}{8}$$

$$2\frac{5}{8}$$

(2)

(Total for question 8 is 4 marks)

9

Work out $\frac{1}{5} + \frac{2}{7}$

$$\frac{7 \times 1}{7 \times 5} + \frac{2 \times 5}{7 \times 5}$$

$$\frac{7}{35} + \frac{10}{35} = \frac{17}{35}$$

$$\frac{17}{35}$$

(Total for question 9 is 2 marks)

10

(a) Work out $\frac{3}{4} - \frac{7}{10}$

$$\frac{5 \times 3}{5 \times 4} - \frac{7 \times 2}{10 \times 2}$$

$$\frac{15}{20} - \frac{14}{20} = \frac{1}{20}$$

$$\frac{1}{20}$$

(2)

(b) Work out $2\frac{1}{3} \times \frac{3}{5}$

Give your answer as a mixed number in its simplest form.

$$\frac{7}{3} \times \frac{3}{5} = \frac{7}{5} = 1\frac{2}{5}$$

$$1\frac{2}{5}$$

(2)

(Total for question 10 is 4 marks)

11

Work out $\frac{5}{6} - \frac{2}{5}$

$$5 \times \frac{5}{6} - \frac{2 \times 6}{5 \times 6}$$

$$\frac{25}{30} - \frac{12}{30} = \frac{13}{30}$$

$$\frac{13}{30}$$

(Total for question 11 is 2 marks)

12

(a) Work out $\frac{7}{8} \div \frac{3}{4}$

Give your answer as a mixed number in its simplest form.

$$\frac{7}{\cancel{8}^2} \times \frac{\cancel{4}^1}{3} = \frac{7}{6} = 1 \frac{1}{6}$$

$$1 \frac{1}{6}$$

(b) Work out $1\frac{5}{6} \times \frac{2}{9}$

$$\frac{11}{6} \times \frac{2}{9} = \frac{22}{54} = \frac{11}{27}$$

$$\frac{11}{27}$$

(2)

(Total for question 12 is 4 marks)

13 Work out $1\frac{3}{5} \div \frac{3}{4}$

$$\frac{8}{5} \div \frac{3}{4}$$

$$\frac{8}{5} \times \frac{4}{3} = \frac{32}{15} \text{ or } 2\frac{2}{15}$$

$$\frac{32}{15}$$

(Total for question 13 is 2 marks)

14 (a) Work out $2\frac{1}{5} + 1\frac{1}{7}$

$$7 \times \frac{11}{5} + \frac{8}{7} \times 5$$

$$7 \times \frac{11}{5} + \frac{8}{7} \times 5$$

$$\frac{77}{35} + \frac{40}{35} = \frac{117}{35} \text{ or } 3\frac{12}{35}$$

$$\frac{117}{35}$$

(2)

(b) Work out $1\frac{1}{6} \div \frac{2}{3}$

Give your answer as a mixed number in its simplest form.

$$\frac{7}{6} \div \frac{2}{3}$$

$$\frac{7}{6} \times \frac{3}{2} = \frac{7}{4} = 1\frac{3}{4}$$

$$1\frac{3}{4}$$

(2)

(Total for question 14 is 4 marks)

- 1 Write down the value of the 8 in the number 583

80 or 8 tens

(Total for question 1 is 1 mark)

- 2 Write down the value of the 5 in the number 583.2

500 or 5 hundreds

(Total for question 2 is 1 mark)

- 3 Write down the value of the 3 in the number 3091

3000 or 3 thousands

(Total for question 3 is 1 mark)

- 4 Write down the value of the 2 in the number 6024

20 or 2 tens

(Total for question 4 is 1 mark)

- 5 Write down the value of the 7 in the number 204.7

0.7 or 7 tenths

(Total for question 5 is 1 mark)

- 6 Write down a 5 digit number that has 3 as its thousands digit.
You can only use the digit 3 once.

any with 3 ---

13500

(Total for question 6 is 1 mark)

- 7 Write down a 6 digit number that has 8 as its hundreds digit.
You can only use the digit 8 once.

--- 8 ---

123800

(Total for question 7 is 1 mark)

- 8 Write down a 4 digit number that has 7 as its tens digit.
You can only use the digit 7 once.

 7

1070

(Total for question 8 is 1 mark)

- 9 Write the number 2 million in figures.

2 000 000

(Total for question 9 is 1 mark)

- 10 Write the number 5.3 million in figures.

5 300 000

(Total for question 10 is 1 mark)

- 11 Here are 4 number cards.

| | | | |
|---|---|---|---|
| 5 | 7 | 2 | 3 |
|---|---|---|---|

- (a) Write down the largest three digit number that can be made using these number cards.

753

- (b) Arrange the cards to give the smallest possible answer to the sum.

(1)

| | | | | |
|---|---|---|---|---|
| 2 | 5 | + | 3 | 7 |
|---|---|---|---|---|

(1)

or 35 and 27

(Total for question 11 is 2 marks)

- 12 Write the following numbers in order of size.
Start with the smallest number.

134

153

203

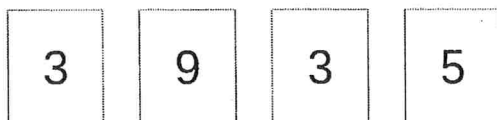
146

154

134 146 153 154 203

(Total for question 12 is 1 mark)

- 13 Here are 4 number cards.



- (a) Write down the smallest four digit number that can be made using these number cards.

3 3 5 9

- (b) Arrange the cards to give the largest possible answer to the sum.

(1)

| | | | | |
|---|---|---|---|---|
| 9 | 3 | + | 5 | 3 |
|---|---|---|---|---|

(1)

(Total for question 13 is 2 marks)

- 14 Write the following numbers in order of size.
Start with the smallest number.

0.35 / 0.305 / 0.53 / 0.053 / 0.035 /

0.035 0.053 0.305 0.35 0.53

(Total for question 14 is 1 mark)

- 15 Write the following numbers in order of size.
Start with the smallest number.

1.6 / 1.06 / 1.5 / 1.53 / 1.563 /

1.06 1.5 1.53 1.563 1.6

(Total for question 15 is 1 mark)

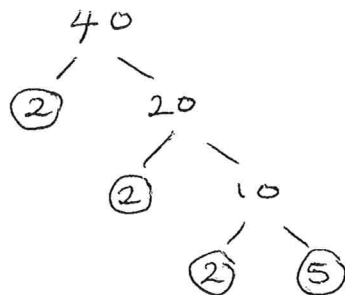
- 16 Write the following numbers in order of size.
Start with the smallest number.

3.2 / 3.27 / 3.72 / 3.702 / 3.02 /

3.02 3.2 3.27 3.702 3.72

(Total for question 16 is 1 mark)

- 1 Write 40 as a product of its prime factors.



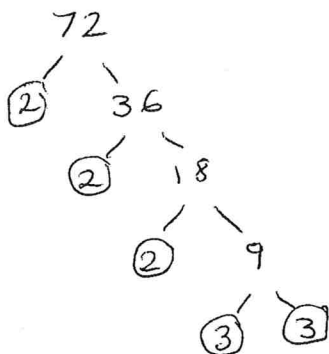
$$2 \times 2 \times 2 \times 5$$

or $2^3 \times 5$

$$2^3 \times 5$$

(Total for question 1 is 2 marks)

- 2 Write 72 as a product of its prime factors.



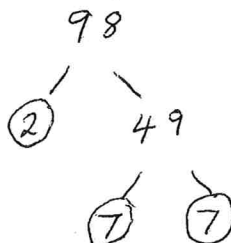
$$2 \times 2 \times 2 \times 3 \times 3$$

or $2^3 \times 3^2$

$$2^3 \times 3^2$$

(Total for question 2 is 2 marks)

- 3 Write 98 as a product of its prime factors.



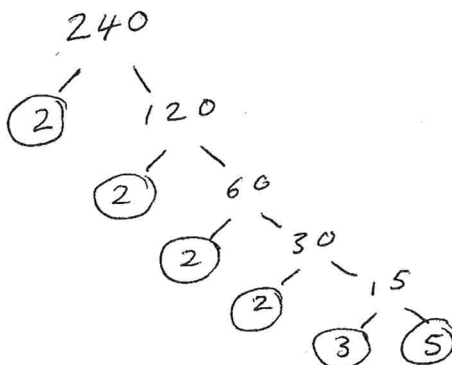
$$2 \times 7 \times 7$$

or 2×7^2

$$2 \times 7^2$$

(Total for question 3 is 2 marks)

- 4 Write 240 as a product of its prime factors.



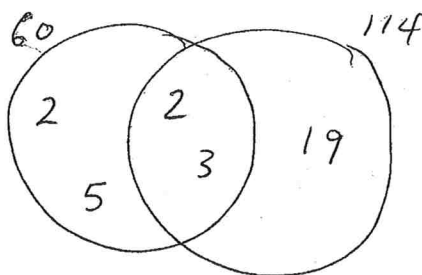
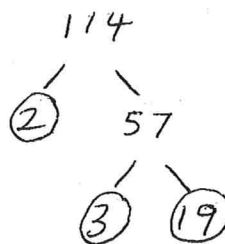
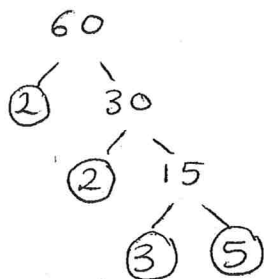
$$2 \times 2 \times 2 \times 2 \times 3 \times 5$$

or $2^4 \times 3 \times 5$

$$2^4 \times 3 \times 5$$

(Total for question 4 is 2 marks)

- 5 Find the highest common factor (HCF) of 60 and 114

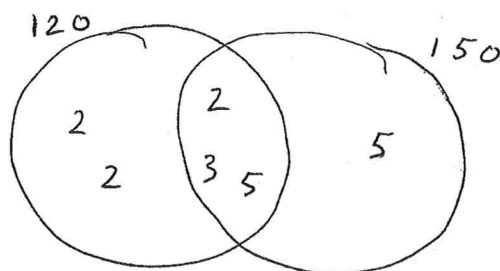
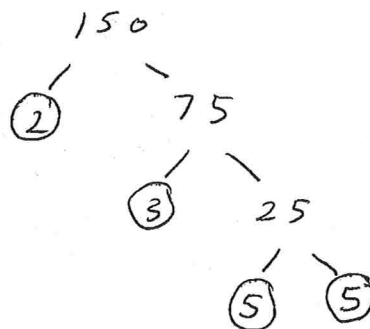
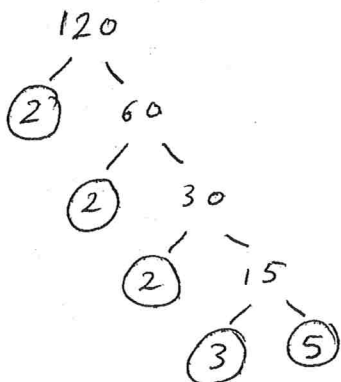


$$\text{HCF} = 2 \times 3 = 6$$

6

(Total for question 5 is 3 marks)

- 6 Find the lowest common multiple (LCM) of 120 and 150

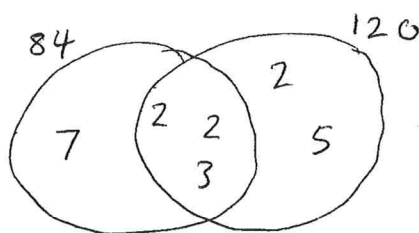
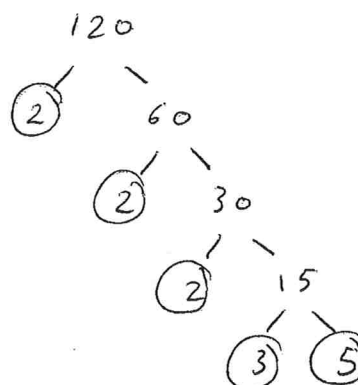
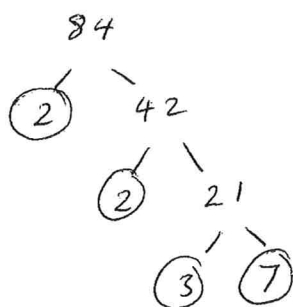


$$\begin{aligned}\text{LCM} &= 120 \times 5 \\ &= 600\end{aligned}$$

600

(Total for question 6 is 3 marks)

- 7 Find the highest common factor (HCF) of 84 and 120

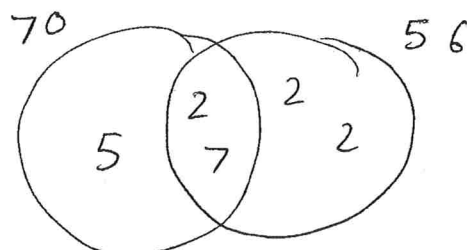
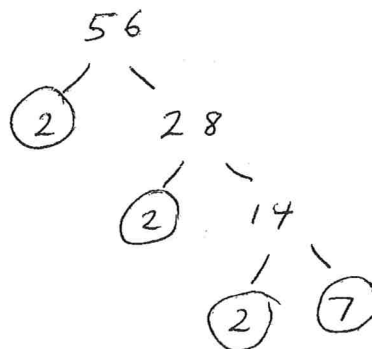
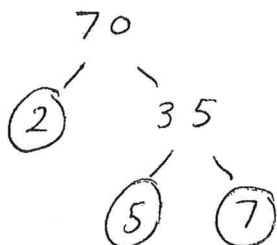


$$\begin{aligned} \text{HCF} &= 2 \times 2 \times 3 \\ &= 12 \end{aligned}$$

12

(Total for question 7 is 3 marks)

- 8 Find the lowest common multiple (LCM) of 70 and 56



$$\begin{aligned} \text{LCM} &= 70 \times 2 \times 2 \\ &= 280 \end{aligned}$$

280

(Total for question 8 is 3 marks)

- 9 Two buses, bus A and bus B, both use the same bus stop.

Bus A runs every 10 minutes.

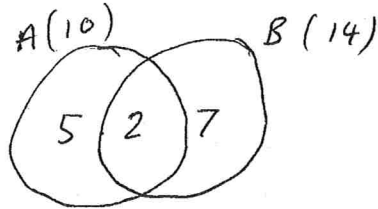
$$10 = 2 \times 5$$

Bus B runs every 14 minutes.

$$14 = 2 \times 7$$

Both buses are at the bus stop at 11 am.

What time will both buses next both be at the bus stop.



$$\begin{aligned} \text{LCM} &= 14 \times 5 \\ &= 70 \end{aligned}$$

70 minutes after 11 am

12:10 pm

(Total for question 9 is 3 marks)

- 10 Light A flashes every 8 seconds.

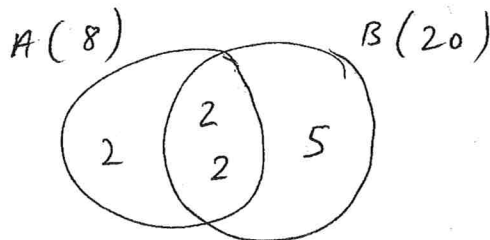
$$8 = 2 \times 2 \times 2$$

Light B flashes every 20 seconds.

$$20 = 2 \times 2 \times 5$$

Both lights flash at the same time.

Work out how long it will take for both lights to flash at the same time again.



$$\text{LCM} = 20 \times 2 = 40$$

40

seconds

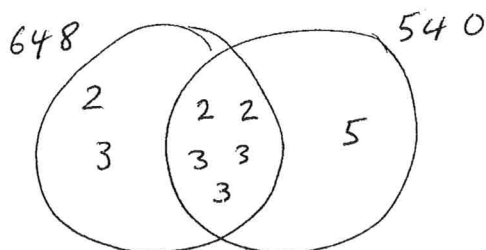
(Total for question 10 is 3 marks)

11

$$648 = 2^3 \times 3^4$$

$$540 = 2^2 \times 3^3 \times 5$$

(a) Write down the highest common factor (HCF) of 648 and 540.



$$2 \times 2 \times 3 \times 3 \times 3$$

$$4 \times 27$$

$$108$$

(1)

(b) Find the lowest common multiple (LCM) of 648 and 540.

$$648 \times 5$$

$$\left[\frac{6480}{2} = 3240 \right]$$

$$3240$$

(2)

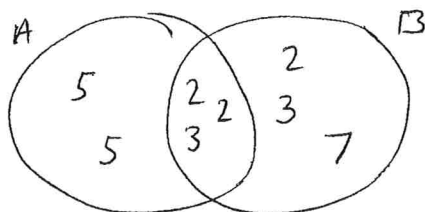
(Total for question 11 is 3 marks)

12

$$A = 2^2 \times 3 \times 5^2$$

$$B = 2^3 \times 3^2 \times 7$$

(a) Write down the highest common factor (HCF) of A and B.



$$2 \times 2 \times 3$$

$$12$$

(1)

(b) Find the lowest common multiple (LCM) of A and B.

$$2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5 \times 7$$

$$8 \times 9 \times 25 \times 7$$

$$72 \times 175$$

$$\begin{array}{r} 175 \\ \times 72 \\ \hline 350 \\ 12250 \\ \hline 12600 \end{array}$$

$$12600$$

(2)

(Total for question 12 is 3 marks)

- 1 (a) Write 1.2×10^5 as an ordinary number.

120 000

(1)

- (b) Write 0.003 in standard form.

3×10^{-3}

(1)

(Total for Question 1 is 2 marks)

- 2 (a) Write 42 900 000 in standard form.

4.29×10^7

(1)

- (b) Write 3.61×10^{-3} as an ordinary number.

0.00361

(1)

(Total for Question 2 is 2 marks)

- 3 (a) Write 9.516×10^6 as an ordinary number.

9 516 000

(1)

- (b) Write 0.0724 in standard form.

7.24×10^{-2}

(1)

- (c) Calculate $(8.694 \times 10^2) \div (6.21 \times 10^{-3})$
Give your answer in standard form.

Type in calculator

140000

1.4×10^5

(2)

(Total for Question 3 is 4 marks)

- 4 (a) Write 5.12×10^{-5} as an ordinary number.

0.0000512
(1)

- (b) Write 5 600 000 in standard form.

5.6×10^6
(1)

(Total for Question 4 is 2 marks)

- 5 (a) Write 0.0065 in standard form.

6.5×10^{-3}
(1)

- (b) Write 3×10^4 as an ordinary number.

30 000
(1)

(Total for Question 5 is 2 marks)

- 6 (a) Write 3.08×10^{-5} as an ordinary number.

0.0000308
(1)

- (b) Write 5 million in standard form.

5 000 000

5×10^6
~~5 000 000~~

- (c) Calculate $(6.3 \times 10^5) \times (2.5 \times 10^{-2})$
Give your answer in standard form.

15750

1.575×10^4
(2)

(Total for Question 6 is 4 marks)

- 7 Work out $(8.69 \times 10^{-5}) \div (5.5 \times 10^{-7})$
Give your answer in standard form.

158

1.58×10^2

(Total for Question 7 is 2 marks)

- 8 (a) Write 0.00931 in standard form.

9.31×10^{-3}

- (b) Write 7.429×10^3 as an ordinary number.

(1)

7429

(1)

(Total for Question 8 is 2 marks)

- 9 (a) Write 5.2×10^{-1} as an ordinary number.

0.52

(1)

- (b) Work out the value of $(3.2 \times 10^3) \times (6.5 \times 10^4)$
Give your answer in standard form.

208000000

2.08×10^8

(2)

(Total for Question 9 is 3 marks)

- 10 Write 0.21×10^6 in standard form.

$0.21 \times 10 \times 10^5$

2.1×10^5

(Total for Question 10 is 1 mark)

- 11 Work out $(6.7 \times 10^4) \times (3.4 \times 10^{-8})$
Give your answer as an ordinary number.

$$2.278 \times 10^{-3}$$

$$0.002278$$

(Total for Question 11 is 2 marks)

- 12 Work out $\frac{0.03 \times 0.02}{0.008}$
Give your answer in standard form.

without a calculator:

$$\frac{3 \times 10^{-2} \times 2 \times 10^{-2}}{8 \times 10^{-3}}$$

$$\frac{6 \times 10^{-4}}{8 \times 10^{-3}} = 0.75 \times 10^{-1}$$

$$= \underline{\underline{7.5 \times 10^{-2}}}$$

$$7.5 \times 10^{-2}$$

(Total for Question 12 is 3 marks)

- 13 Work out $\frac{3.744 \times 10^9}{2.4 \times 10^5}$
Give your answer in standard form.

$$15600$$

$$1.56 \times 10^4$$

(Total for Question 13 is 2 marks)

- 14 Work out the value of $(5 \times 10^3) \times (6 \times 10^7)$
Give your answer in standard form.

without calc: 30×10^{10}
 3×10^{11}

$$3 \times 10^{11}$$

(Total for Question 14 is 2 marks)

- 15 (a) Write 0.000 054 376 in standard form.

$$5.4376 \times 10^{-5}$$

(1)

- (b) Write 4.15×10^6 as an ordinary number.

$$4\,150\,000$$

(1)

- (c) Work out $\frac{4.1 \times 10^5 \times 7.3 \times 10^4}{2 \times 10^{-6}}$

$$1.4965 \times 10^{16}$$

(2)

(Total for Question 15 is 4 marks)

- 16 Write these numbers in order of size.
Start with the smallest number.

6.1×10^2

610

0.061×10^2

6.1

6100×10^{-4}

0.61

61

61

$$6100 \times 10^{-4} \quad 0.061 \times 10^2 \quad 61 \quad 6.1 \times 10^2$$

(Total for Question 16 is 2 marks)

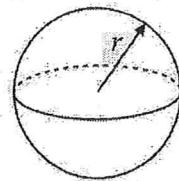
- 17 A sphere has a radius of 6.4×10^6 metres.
Calculate the volume of this sphere.

Give your answer in standard form to 1 decimal place.

$$\frac{4}{3} \pi (6.4 \times 10^6)^3$$

Volume of sphere = $\frac{4}{3} \pi r^3$

Surface area of sphere = $4\pi r^2$



$$1.1 \times 10^{21} \text{ m}^3$$

(Total for Question 17 is 3 marks)

- 18 A large rock has a weight of 1.2×10^4 grams.

Find, in standard form, the weight of 12 of these large rocks.

$$1.2 \times 10^4 \times 12$$

$$1.2 \times 10^4 \times 1.2 \times 10^1$$

$$1.44 \times 10^5$$

grams

(Total for Question 18 is 2 marks)

- 19 Write these numbers in order of size.
Start with the smallest number.

$$3.5 \times 10^2$$

$$350$$

$$0.035 \times 10^5$$

$$3500$$

$$350 \times 10^{-2}$$

$$3.5$$

$$35 \times 10^0$$

$$35$$

$$350 \times 10^{-2}$$

$$35 \times 10^0$$

$$3.5 \times 10^2$$

$$0.035 \times 10^5$$

(Total for Question 19 is 2 marks)

- 20 The diameter of Neptune is 5.0×10^4 km

The diameter of Mars is 6.8×10^3 km

Calculate the difference between the diameter of Neptune and the diameter of Mars.

Give your answer in standard form.

$$5 \times 10^4 = 50000$$

$$6.8 \times 10^3 = 6800$$

$$50000 - 6800 = 43200$$

$$4.32 \times 10^4$$

km

(Total for Question 20 is 2 marks)

- 21 One electron has a mass of 9.1×10^{-31} grams.

Find the mass of 250 of electrons.

$$9.1 \times 10^{-31} \times 250$$

$$2.275 \times 10^{-28}$$

grams

(Total for Question 21 is 2 marks)

- 22 The area of Australia is $7.7 \times 10^6 \text{ km}^2$
 The area of Cyprus is $9.3 \times 10^3 \text{ km}^2$
 How many times larger is Australia than Cyprus.
 Give your answer to the nearest whole number.

$$\frac{7.7 \times 10^6}{9.3 \times 10^3} = 827.956 \dots$$

828

(Total for Question 22 is 2 marks)

- 23 The area of the Pacific Ocean is $3.61 \times 10^8 \text{ km}^2$
 The area of the Atlantic Ocean is $8.51 \times 10^7 \text{ km}^2$
 Find the total area of the Pacific Ocean and the Atlantic Ocean.
 Give your answer in standard form.

$$3.61 \times 10^8 + 8.51 \times 10^7$$

446100000

$$4.461 \times 10^8 \text{ km}^2$$

(Total for Question 23 is 2 marks)

- 24 The distance between Earth and Mars is 78 000 000 kilometres.
 The speed of light is $3 \times 10^5 \text{ km/s}$

Calculate the time, in seconds, it takes for light to travel from Earth to Mars.
 Give your answer in standard form.

$$\text{Time} = \frac{78000000}{3 \times 10^5} = \frac{780}{3} = 260$$

$$= 260$$

$$= 2.6 \times 10^2$$

2.6 × 10² s

(Total for Question 24 is 2 marks)

- 1 Work out an estimate for the value of $\frac{48.7 \times 61.2}{11.3}$

$$\frac{50 \times 60}{10} = \frac{3000}{10} = 300$$

.....300

(Total for Question 1 is 3 marks)

- 2 Work out an estimate for the value of $\frac{41.2 \times 19.8}{0.49}$

$$\frac{40 \times 20}{0.5} = \frac{800}{0.5} = 1600$$

.....1600

(Total for Question 2 is 3 marks)

- 3 Work out an estimate for the value of $\frac{28.4 \times 21.05}{5.9}$

$$\frac{30 \times 20}{6} = \frac{600}{6} = 100$$

.....100

(Total for Question 3 is 3 marks)

- 4 Work out an estimate for the value of $\frac{7.4 + 23.05}{0.196}$

$$\frac{7 + 23}{0.2} = \frac{30}{0.2} = 150$$

$$\left[\text{OR } \frac{7 + 20}{0.2} = \frac{27}{0.2} = 135 \right]$$

.....150

(Total for Question 4 is 3 marks)

- 5 Work out an estimate for the value of $\frac{91.25 \times 4.87}{2.31}$

$$\frac{90 \times 5}{2} = \frac{450}{2} = 225$$

.....225

(Total for Question 5 is 3 marks)

- 6 Work out an estimate for the value of $\frac{18.3 + 62.8}{0.13}$

$$\frac{20 + 60}{0.1} = \frac{80}{0.1} = 800$$

.....800

(Total for Question 6 is 3 marks)

- 7 Work out an estimate for the value of $\frac{21.75 + \sqrt{98.1}}{0.192}$

$$\frac{20 + \sqrt{100}}{0.2} = \frac{20 + 10}{0.2} = \frac{30}{0.2} = 150$$

150

(Total for Question 7 is 3 marks)

- 8 Work out an estimate for the value of $\frac{8.3 \times 18.7}{0.52}$

$$\frac{8 \times 20}{0.5} = \frac{160}{0.5} = 320$$

320

(Total for Question 8 is 3 marks)

- 9 Eddie and Ellen use a calculator to work out $\frac{431.1}{14.3 + 3.8^2}$

Eddie's answer is 1.5

Ellen's answer is 15

One of those answers is correct.

Use approximations to find out which answer is correct.

$$\frac{400}{14 + 4^2} \left[\text{or } \frac{400}{10 + 4^2} \right]$$
$$\frac{400}{14 + 16} = \frac{400}{30} = 13.\bar{3}$$

Ellen's answer is correct.

(Total for Question 9 is 3 marks)

10

Ciara drives an average of ⁴⁰43.6 miles per week

52 weeks in
a year

(a) Work out an estimate for the number of miles Ciara drives in a year.

$$40 \times 50 = 2000$$

2000 miles

(2)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

underestimate - I rounded down the miles
per week and the number of weeks in a year

(1)

(Total for Question 10 is 3 marks)

11

Dennis gets paid ⁸£8.21 per hour he works.
Each week Dennis works 41 hours.

(a) Work out an estimate for the amount Dennis gets paid in a week.

$$8 \times 40 = 320$$

£ 320

(2)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

underestimate - I rounded down the
pay and number of hours

(1)

(Total for Question 11 is 3 marks)

- 12 Mr Sykes wants to buy a calculator for every student in year 11.
There are 104 students in year 11. ¹⁰⁰
Each calculator costs £6.05 ⁶

(a) Work out an estimate for the amount of money Mr Sykes will spend on calculators.

$$100 \times 6$$

£ 600 (2)

- (b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

underestimate - I rounded down the
number of students and the cost.

(1)

(Total for Question 12 is 3 marks)

- 13 ³Phoebe's pays 2.8 pence per minute to use her phone.
On average Phoebe uses her phone for 77 minutes per day.

She pays the phone bill for 29 days. ⁸⁰

- (a) Work out an estimate for how much Phoebe pays. ³⁰

$$3 \times 80 \times 30$$

$$80 \times 90$$

$$7200 \text{ p}$$

£ 72

- (b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

(3)

overestimate - I rounded all the numbers
up

(1)

(Total for Question 13 is 4 marks)

14

A circle has a radius of 11 metres.

(a) Work out an estimate for the area of the circle.

$$\begin{aligned}
 \text{Area} &= \pi r^2 \\
 &= 3 \times 10^2 \\
 &= 3 \times 100 \\
 &= 300
 \end{aligned}$$

$$\begin{array}{r}
 300 \\
 \hline
 \text{or } 363 \quad (3)
 \end{array} \text{m}^2$$

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

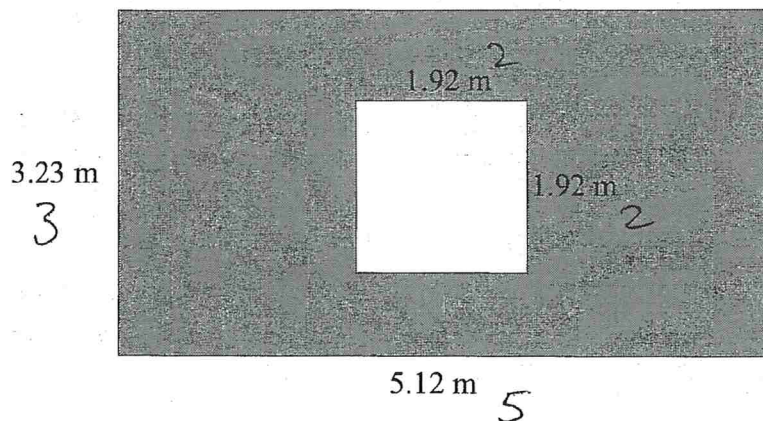
underestimate - I rounded π and the radius down

(1)

(Total for Question 14 is 4 marks)

15

A shape is formed by cutting a square out of a rectangle.



(a) Work out an estimate for the area of the shape.

$$\begin{aligned}
 \text{Big shape} \quad 3 \times 5 &= 15 \text{ m}^2 \\
 \text{Small shape} \quad 2 \times 2 &= 4 \text{ m}^2
 \end{aligned}$$

$$15 - 4 = 11$$

$$\begin{array}{r}
 11 \\
 \hline
 \text{m}^2
 \end{array} \quad (3)$$

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

underestimate - the big shape will have a greater area and the small shape will have a smaller area.

(1)

(Total for Question 15 is 4 marks)

40

16 A baby was born every 43 seconds in the UK in 2018

~~(a)~~ Work out an estimate for the total number of babies born in the UK in 2018.
You must show how you get your answer.

Number of seconds in a year

40

Number of seconds in a year = $60 \times 60 \times 24 \times 365$

$$\approx 60 \times 60 \times 20 \times 400$$

$$3600 \times 8000$$

$$\approx 4000 \times 8000$$

$$\underline{32\,000\,000}$$

$$\underline{32\,000\,000}$$

$$40$$

$$\underline{\underline{800\,000}}$$

800 000

(Total for Question 16 is 4 marks)

[600 000 to 900 000]

1 Simplify $3x + 4x - 2x$

$$7x - 2x$$

$$5x$$

(Total for question 1 is 1 mark)

2 Simplify $3m + 3m$

$$6m$$

(Total for question 2 is 1 mark)

3 Simplify $n + n + n$

$$3n$$

(Total for question 3 is 1 mark)

4 (a) Simplify $a \times b \times c$

$$abc$$

(1)

(b) Simplify $5p - 2p$

$$3p$$

(1)

(c) Simplify $\frac{6h}{3}$

$$2h$$

(1)

(Total for question 4 is 3 marks)

5 Simplify $k + k + 8$

$$2k + 8$$

(Total for question 5 is 1 mark)

6 (a) Simplify $4 \times 3x$

$$12x$$

(1)

(b) Simplify $7a - 3a + 6a$

$$4a + 6a$$

$$10a$$

(1)

(Total for question 6 is 2 marks)

7 Simplify $(8g) + 6h - (3g) + h$

$$5g + 7h$$

(Total for question 7 is 2 marks)

8 (a) Simplify $3 \times b \times 9$

$$27b$$

(1)

(b) Simplify $(2x) - 3y - (6x) - 4y$

$$-4x - 7y$$

(2)

(Total for question 8 is 3 marks)

9 Simplify $(8c) + 3d - c + 2d$

$$7c + 5d$$

(Total for question 9 is 2 marks)

10 (a) Simplify $f + f + f + f + f$

$$5f$$

(1)

(b) Simplify $(5a) + 3b + (2a) + 2b$

$$7a + 5b$$

(2)

(Total for question 10 is 3 marks)

11 (a) Simplify $2a \times 3b$

$$6ab$$

(1)

(b) Simplify $2p \times 2p$

$$4p^2$$

(1)

(c) Simplify $\frac{7x + 5x}{4}$

$$\frac{12x}{4}$$

$$3x$$

(1)

(Total for question 11 is 3 marks)

12 Simplify $(11c) - 8d + (5c) - d$

$$16c - 9d$$

(Total for question 12 is 2 marks)

13 (a) Simplify $3a \times 4b$

$$12ab$$

(1)

(b) Simplify $(3x) + 2y + (6x) - y$

$$9x + y$$

(2)

(Total for question 13 is 3 marks)

14 (a) Simplify $a \times b \times 3$

$$3ab$$

(1)

(b) Simplify $y \times y \times y$

$$y^3$$

(1)

(c) Simplify $\frac{10d}{d}$

$$10$$

(1)

(Total for question 14 is 3 marks)

15 (a) Simplify $a \times 2 \times 5$

$$\frac{10a}{(1)}$$

(b) Simplify $b \times b$

$$\frac{b^2}{(1)}$$

(c) Simplify $\frac{2y + 6y}{2}$

$$\frac{8y}{2}$$

$$\frac{4y}{(1)}$$

(Total for question 15 is 3 marks)

16 (a) Simplify $2t \times 7s$

$$\frac{14st}{(1)}$$

(b) Simplify $(7a) + 4b(-3a) - 5b$

$$\frac{4a - b}{(2)}$$

(Total for question 16 is 3 marks)

17 (a) Simplify $6f - f$

$$\frac{5f}{(1)}$$

(b) Simplify $(7x^2) - 3x(3x^2) + 6x$

$$\frac{10x^2 + 3x}{(2)}$$

(Total for question 17 is 3 marks)

18 Simplify $2 \times n \times 6 \times m$

$$12mn$$

$$12mn$$

(Total for question 18 is 1 mark)

19 (a) Simplify $6j \times 5k$

$$30jk$$

(1)

(b) Simplify $(7a) - 6b + (5a) + 4b$

$$12a - 2b$$

(2)

(Total for question 19 is 3 marks)

20 (a) Simplify $4n - 3n + 5n$

$$n + 5n$$

$$6n$$

(1)

(b) Simplify $p^2 + p^2 + p^2$

$$3p^2$$

(1)

(c) Simplify $5 + (2a) + 7b - (6a) + b$

$$5 - 4a + 8b$$

(2)

(Total for question 20 is 4 marks)

21 (a) Simplify $a^2 + a^2 + a^2$

$$\frac{3a^2}{(1)}$$

(b) Simplify $2rs - 5rs + 4rs$

$$-3rs + 4rs$$

$$\frac{rs}{(1)}$$

(c) Simplify $4a(+2) - 7a + a(-6)$

$$\frac{-2a - 4}{(2)}$$

(Total for question 21 is 4 marks)

22 (a) Simplify $n + n + n - n$

$$3n - n$$

$$\frac{2n}{(1)}$$

(b) Simplify $3xy + 2xy - xy$

$$5xy - xy$$

$$\frac{4xy}{(1)}$$

(c) Simplify $(4a) + 3b(-a) + 3b + 6$

$$\frac{3a + 6b + 6}{(2)}$$

(Total for question 22 is 4 marks)

1 $f=7$
 $g=5$

Work out the value of $3f+2g$

$$\begin{aligned} 3(7) + 2(5) \\ 21 + 10 \end{aligned}$$

31

(Total for Question 1 is 2 marks)

2 $c=4d-7$

Find the value of c when $d=6$

$$\begin{aligned} c &= 4(6) - 7 \\ &= 24 - 7 \\ &= 17 \end{aligned}$$

17

(Total for Question 2 is 2 marks)

3 $v=u+at$

$u=3$
 $a=10$
 $t=6$

$$\begin{aligned} v &= 3 + 10(6) \\ &= 3 + 60 \\ &= 63 \end{aligned}$$

Work out the value of v .

$v = 63$

(Total for Question 3 is 2 marks)

4 $x=4$
 $y=6$

Work out the value of $3x-y$

$$\begin{aligned} 3(4) - 6 \\ 12 - 6 \\ 6 \end{aligned}$$

6

(Total for Question 4 is 2 marks)

5 $L = 9m + 2n$

Work out the value of L when $m = 3$ and $n = -6$

$$\begin{aligned} L &= 9(3) + 2(-6) \\ &= 27 - 12 \\ &= 15 \end{aligned}$$

15

(Total for Question 5 is 2 marks)

6 $q = 5p + 3r$

$p = 6$
 $r = -4$

Work out the value of q .

$$\begin{aligned} q &= 5(6) + 3(-4) \\ &= 30 - 12 \\ &= 18 \end{aligned}$$

18

(Total for Question 6 is 2 marks)

7 $H = 4f + g$

Work out the value of H when $f = 5$ and $g = -2$

$$\begin{aligned} H &= 4(5) - 2 \\ &= 20 - 2 \\ &= 18 \end{aligned}$$

18

(Total for Question 7 is 2 marks)

8 $A = 4p + 5q$

$p = 3$
 $q = -2$

Work out the value of A .

$$\begin{aligned} A &= 4(3) + 5(-2) \\ &= 12 - 10 \\ &= 2 \end{aligned}$$

2

(Total for Question 8 is 2 marks)

9 $L = 9m + 2n$

Work out the value of L when $m = -3$ and $n = 4$

$$\begin{aligned} L &= 9(-3) + 2(4) \\ &= -27 + 8 \\ &= -19 \end{aligned}$$

-19

(Total for Question 9 is 2 marks)

10 $q = 6p - r$

$p = -4$
 $r = 5$

Work out the value of q .

$$\begin{aligned} q &= 6(-4) - 5 \\ &= -24 - 5 \\ &= -29 \end{aligned}$$

-29

(Total for Question 10 is 2 marks)

11 $H = f - 2g$

Work out the value of H when $f = 12$ and $g = -6$

$$\begin{aligned} H &= 12 - 2(-6) \\ &= 12 + 12 \\ &= 24 \end{aligned}$$

24

(Total for Question 11 is 2 marks)

12 $A = 5p + 6q$

$p = 10$
 $q = -2$

Work out the value of A .

$$\begin{aligned} A &= 5(10) + 6(-2) \\ &= 50 - 12 \\ &= 38 \end{aligned}$$

38

(Total for Question 12 is 2 marks)

13 $L = m(n - 2)$

Work out the value of L when $m = 9$ and $n = 5$

$$\begin{aligned} L &= 9(5 - 2) \\ &= 9(3) \\ &= 27 \end{aligned}$$

27

(Total for Question 13 is 2 marks)

14 $a = 5bc$

$b = -4$

$c = -3$

Work out the value of a .

$$\begin{aligned} a &= 5(-4)(-3) \\ &= -20(-3) \\ &= 60 \end{aligned}$$

60

(Total for Question 14 is 2 marks)

15 $x = 4y^2 - 12$

Work out the value of x when $y = 5$

$$\begin{aligned} x &= 4(5)^2 - 12 \\ &= 4(25) - 12 \\ &= 100 - 12 \\ &= 88 \end{aligned}$$

88

(Total for Question 15 is 2 marks)

16 $A = p - 2q$

$p = -4$

$q = -7$

Work out the value of A .

$$\begin{aligned} A &= -4 - 2(-7) \\ &= -4 + 14 \\ &= 10 \end{aligned}$$

10

(Total for Question 16 is 2 marks)

17 $a = 8$
 $b = -5$
 $c = 2$

Work out the value of $b^2 - 4ac$

$$(-5)^2 - 4(8)(2)$$

$$25 - 32(2)$$

$$25 - 64$$

$$-39$$

$$-39$$

(Total for Question 17 is 2 marks)

18 $d = \frac{m}{v}$

Work out the value of d when $m = 32$ and $v = 8$

$$d = \frac{32}{8} = 4$$

$$4$$

(Total for Question 18 is 2 marks)

19 $A = 2j - jk$

Work out the value of A when $j = 7$ and $k = 3$

$$A = 2(7) - 7(3)$$

$$= 14 - 21$$

$$= -7$$

$$-7$$

(Total for Question 19 is 2 marks)

20 $w = 5x^2 + 3$

$$x = -3$$

Work out the value of w .

$$w = 5(-3)^2 + 3$$

$$= 5(9) + 3$$

$$= 45 + 3$$

$$= 48$$

$$48$$

(Total for Question 20 is 2 marks)

21 $A = \frac{1}{2}bh$

Work out the value of A when $b = 3$ and $h = 8$

$$\begin{aligned} A &= \frac{1}{2}(3)(8) \\ &= \frac{1}{2}(24) \\ &= 12 \end{aligned}$$

12

(Total for Question 21 is 2 marks)

22 $A = \frac{1}{2}(a+b)h$

Work out the value of A when $a = 7$, $b = 6$ and $h = 10$

$$\begin{aligned} A &= \frac{1}{2}(7+6)(10) \\ &= \frac{1}{2}(13)(10) \\ &= \frac{1}{2}(130) = 65 \end{aligned}$$

65

(Total for Question 22 is 2 marks)

23 $v = u + at$

Work out the value of v when $u = 12$, $a = -6$ and $t = 5$

$$\begin{aligned} v &= 12 + (-6)(5) \\ &= 12 - 30 \\ &= -18 \end{aligned}$$

-18

(Total for Question 23 is 2 marks)

24 $y = mx + c$

$m = -2$

$x = 12$

$c = -7$

$$\begin{aligned} y &= -2(12) + (-7) \\ &= -24 - 7 \\ &= -31 \end{aligned}$$

Work out the value of y .

-31

(Total for Question 24 is 2 marks)

25 $s = ut + \frac{1}{2}at^2$

$u = 3$

$a = 2$

$t = 4$

Work out the value of s .

$$\begin{aligned} s &= 3(4) + \frac{1}{2}(2)(4)^2 \\ &= 12 + \frac{1}{2}(2)(16) \\ &= 12 + 16 \\ &= 28 \end{aligned}$$

$s = 28$

(Total for Question 25 is 2 marks)

26 $s = ut + \frac{1}{2}at^2$

$u = -5$

$a = 4$

$t = 3$

Work out the value of s .

$$\begin{aligned} s &= (-5)(3) + \frac{1}{2}(4)(3)^2 \\ &= -15 + \frac{1}{2}(4)(9) \\ &= -15 + 2(9) \\ &= -15 + 18 \\ &= 3 \end{aligned}$$

$s = 3$

(Total for Question 26 is 2 marks)

27 $s = \frac{v^2 - u^2}{2a}$

$v = 7$

$u = 5$

$a = 3$

Work out the value of s .

$$\begin{aligned} s &= \frac{(7)^2 - (5)^2}{2(3)} \\ &= \frac{49 - 25}{6} \\ &= \frac{24}{6} \\ &= 4 \end{aligned}$$

$s = 4$

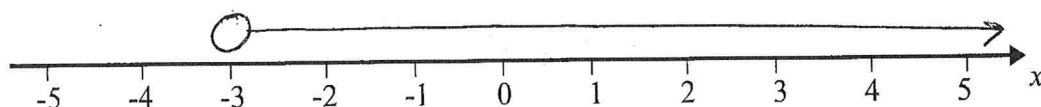
(Total for Question 27 is 2 marks)

- 1 n is an integer such that $-2 \leq n < 3$
Write down all the possible values of n .

$-2, -1, 0, 1, 2$

(Total for question 1 is 2 marks)

- 2 (a) On the number line, show the inequality $x > -3$



(2)

$1 \leq y < 5$ where y is an integer.

- (b) Write down all the possible values of y .

$1, 2, 3, 4$

(2)

- (c) Solve $4t + 7 \leq 19$

$$\begin{array}{r} -7 \\ -7 \end{array}$$

$$4t \leq 12$$

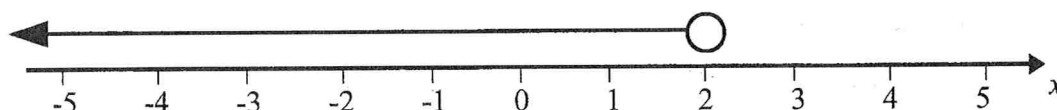
$$t \leq 3$$

$t \leq 3$

(2)

(Total for question 2 is 6 marks)

- 3 Write down the inequality shown on the number line.



$x < 2$

(Total for question 3 is 2 marks)

4 (a) $-1 < n \leq 3$ where n is an integer.

(b) Write down all the possible values of n .

..... 0, 1, 2, 3 (2)

(c) Solve $2x - 5 > 8$

$$+ 5 \quad + 5$$

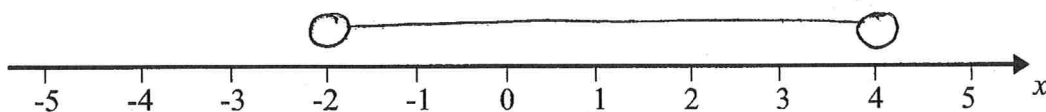
$$2x > 13$$

$$x > \frac{13}{2}$$

$$..... x > \frac{13}{2} (2)$$

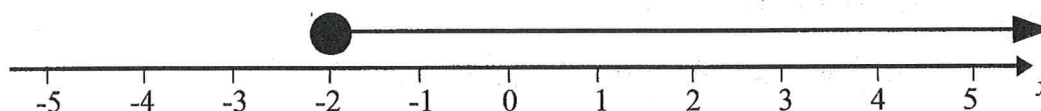
(Total for question 4 is 4 marks)

5 (a) On the number line, show the inequality $-2 < x < 4$



(2)

(b) Write down the inequality shown on the number line.



$$..... x \geq -2 (2)$$

(Total for question 5 is 4 marks)

- 6 (a) On the number line, show the inequality $n < 2$.



(2)

$4 \leq y < 8$ where y is an integer.

- (b) Write down all the possible values of y .

4, 5, 6, 7

(2)

- (c) Solve $4x + 6 \leq x + 21$

$$\begin{array}{r} -x \\ -x \end{array}$$

$$\begin{array}{r} 3x + 6 \leq 21 \\ -6 \quad -6 \end{array}$$

$$3x \leq 15$$

$$x \leq 5$$

$$x \leq 5$$

(3)

(Total for question 6 is 7 marks)

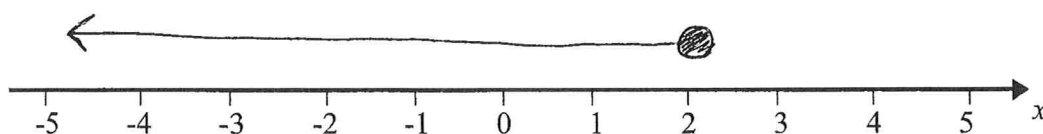
- 7 Solve $4x \leq x + 6$

Show your answer on the number line.

$$\begin{array}{r} 4x \leq x + 6 \\ -x \quad -x \end{array}$$

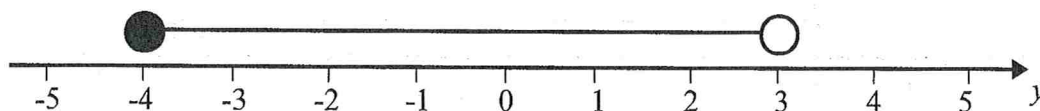
$$3x \leq 6$$

$$x \leq 2$$



(Total for question 7 is 3 marks)

- 8 Write down the inequality shown on the number line.

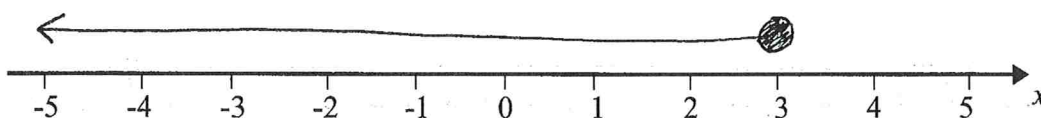


$$-4 \leq y < 3$$

(Total for question 8 is 2 marks)

- 9 (a) On the number line, show the inequality $x + 1 \leq 4$

$$x \leq 3$$



(2)

$5 < 2y < 12$ where y is an integer.

- (b) Write down all the possible values of y .

$$2.5 < y < 6$$

$$3, 4, 5$$

(2)

- (c) Solve $4 > 19 - 3x$

$$+3x \quad +3x$$

$$3x + 4 > 19$$

$$-4 \quad -4$$

$$3x > 15$$

$$x > 5$$

$$x > 5$$

(2)

(Total for question 9 is 6 marks)

- 10 n is an integer such that $-8 < 3n < 10$

Write down all the possible values of n .

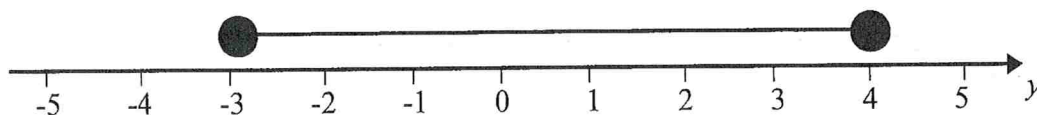
$$-\frac{8}{3} < n < \frac{10}{3}$$

$$-2.\bar{6} < n < 3.\bar{3}$$

$$-2, -1, 0, 1, 2, 3$$

(Total for question 10 is 2 marks)

- 11 Write down the inequality shown on the number line.



$$-3 \leq y \leq 4$$

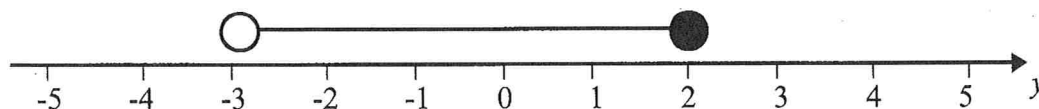
(Total for question 11 is 2 marks)

- 12 (a) On the number line, show the inequality $-4 < n \leq 5$



(2)

- (b) Write down the inequality shown on the number line.



$$-3 < y \leq 2$$

(2)

(Total for question 12 is 4 marks)

- 13 Solve $2(3n - 5) > 12$

$$\begin{array}{rcl} 6n - 10 & > & 12 \\ +10 & & +10 \end{array}$$

$$6n > 22$$

$$n > \frac{22}{6}$$

$$n > \frac{11}{3}$$

$$n > \frac{11}{3}$$

(Total for question 13 is 2 marks)

- 14 n is an integer such that $-3 < 2n < 6$
Write down all the possible values of n .

$$\frac{-3}{2} < n < 3$$

$$-1.5 < n < 3$$

.....
-1, 0, 1, 2

(Total for question 14 is 2 marks)

- 15 Solve $3(n+1) < 24$

$$3n + 3 < 24$$

$$3n < 21$$

$$n < 7$$

.....
 $n < 7$

(Total for question 15 is 2 marks)

- 16 Solve $4(2x+1) > 9$

$$8x + 4 > 9$$

$$8x > 5$$

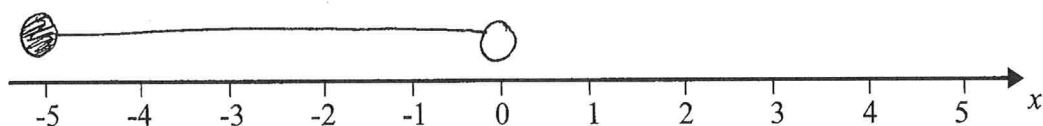
$$x > \frac{5}{8}$$

.....
 $x > \frac{5}{8}$

(Total for question 16 is 2 marks)

17 (a) On the number line, show the inequality $-3 \leq x+2 < 2$

$$-5 \leq x < 0$$



(3)

$1 \leq 2y-3 < 9$ where y is an integer.

$$+3 \quad +3 \quad +3$$

(b) Write down all the possible values of y .

$$4 \leq 2y < 12$$

$$2 \leq y < 6$$

..... 2, 3, 4, 5

(3)

(c) Solve $4x-4 \leq 7x-19$

$$-4x$$

$$-4x$$

$$-4 \leq 3x - 19$$

$$+19$$

$$+19$$

$$15 \leq 3x$$

$$5 \leq x$$

$$x \geq 5$$

$$x \geq 5$$

(3)

(Total for question 17 is 9 marks)

- 1 (a) Factorise $a^2 + 3a - 28$

28

1 28

2 14

4 7

- (b) Solve $a^2 + 3a - 28 = 0$

$$\frac{(a+7)(a-4)}{(2)}$$

$$\frac{a = -7 \text{ or } a = 4}{(1)}$$

(Total for Question 1 is 3 marks)

- 2 (a) Factorise $x^2 - 7x + 10$

10

1 10

2 5

- (b) Solve $x^2 - 7x + 10 = 0$

$$\frac{(x-2)(x-5)}{(2)}$$

$$\frac{x = 2 \text{ or } x = 5}{(1)}$$

(Total for Question 2 is 3 marks)

3 (a) Factorise $b^2 + 9b + 20$

20
1 20
2 10
4 5

(b) Solve $b^2 + 9b + 20 = 0$

$$\underline{(b + 4)(b + 5)} \quad (2)$$

$$\underline{b = -4 \text{ or } b = -5} \quad (1)$$

(Total for Question 3 is 3 marks)

4 (a) Factorise $x^2 - 3x - 18$

18
1 18
2 9
3 6

(b) Solve $x^2 - 3x - 18 = 0$

$$\underline{(x + 3)(x - 6)} \quad (2)$$

$$\underline{x = -3 \text{ or } x = 6} \quad (1)$$

(Total for Question 4 is 3 marks)

- 5 (a) Factorise $y^2 - 10y + 9$

$$\begin{array}{cc} & 9 \\ 1 & 9 \\ 3 & 3 \end{array}$$

- (b) Solve $y^2 - 10y + 9 = 0$

$$(y-1)(y-9) \quad (2)$$

$$y=1 \text{ or } y=9 \quad (1)$$

(Total for Question 5 is 3 marks)

- 6 (a) Factorise $a^2 - a - 56$

$$\begin{array}{cc} & 56 \\ 1 & 56 \\ 2 & 28 \\ 4 & 14 \\ 7 & 8 \end{array}$$

- (b) Solve $a^2 - a - 56 = 0$

$$(a+7)(a-8) \quad (2)$$

$$a=-7 \text{ or } a=8 \quad (1)$$

(Total for Question 6 is 3 marks)

7 Solve $x^2 + 14x + 24 = 0$

24
1 24
2 12
3 8
4 6

$$(x + 2)(x + 12) = 0$$

$$x = -2 \quad x = -12$$

$$x = -2 \text{ or } x = -12$$

(Total for Question 7 is 3 marks)

8 Solve $x^2 + 5x - 6 = 0$

6
1 6
2 3

$$(x - 1)(x + 6) = 0$$

$$x = 1 \quad x = -6$$

$$x = 1 \text{ or } x = -6$$

(Total for Question 8 is 3 marks)

9 Solve $x^2 + 5x + 6 = 0$

$$(x + 2)(x + 3) = 0$$

$$x = -2 \quad x = -3$$

$$x = -2 \text{ or } x = -3$$

(Total for Question 9 is 3 marks)

10 Solve $x^2 - 12x + 32 = 0$

32
1 32
2 16
4 8

$$(x - 4)(x - 8) = 0$$
$$x = 4 \quad x = 8$$

$x = 4$ or $x = 8$
(Total for Question 10 is 3 marks)

11 Solve $x^2 + 19x + 90 = 0$

90
1 90
2 45
3 30
5 18
6 15
9 10

$$(x + 9)(x + 10) = 0$$
$$x = -9 \quad x = -10$$

$x = -9$ or $x = -10$
(Total for Question 11 is 3 marks)

12 Solve $x^2 + 11x - 42 = 0$

42
1 42
2 21
3 14
6 7

$$(x - 3)(x + 14) = 0$$
$$x = 3 \quad x = -14$$

$x = 3$ or $x = -14$
(Total for Question 12 is 3 marks)

13 Solve $a^2 - 10a + 16 = 0$

$$\begin{array}{r} 16 \\ 1 \quad 16 \\ 2 \quad 8 \\ 4 \quad 4 \end{array}$$

$$(a - 2)(a - 8) = 0$$

$$a = 2 \quad a = 8$$

$$a = 2 \text{ or } a = 8$$

(Total for Question 13 is 3 marks)

14 Solve $y^2 - 2y - 35 = 0$

$$\begin{array}{r} 35 \\ 1 \quad 35 \\ 5 \quad 7 \end{array}$$

$$(y + 5)(y - 7) = 0$$

$$y = -5 \quad y = 7$$

$$y = -5 \text{ or } y = 7$$

(Total for Question 14 is 3 marks)

15 Solve $x^2 + 3x - 54 = 0$

$$\begin{array}{r} 54 \\ 1 \quad 54 \\ 2 \quad 27 \\ 3 \quad 18 \\ 6 \quad 9 \end{array}$$

$$(x + 9)(x - 6) = 0$$

$$x = -9 \quad x = 6$$

$$x = -9 \text{ or } x = 6$$

(Total for Question 15 is 3 marks)

16 Solve $b^2 - 10b - 24 = 0$

24
1 24
2 12
3 8
4 6

$$(b + 2)(b - 12) = 0$$

$$b = -2 \quad b = 12$$

$$b = -2 \text{ or } b = 12$$

(Total for Question 16 is 3 marks)

17 Solve $m^2 + 13m + 40 = 0$

40
1 40
2 20
4 10
5 8

$$(m + 5)(m + 8) = 0$$

$$m = -5 \quad m = -8$$

$$m = -5 \text{ or } m = -8$$

(Total for Question 17 is 3 marks)

18 Solve $x^2 + 10x - 24 = 0$

24
1 24
2 12
3 8
4 6

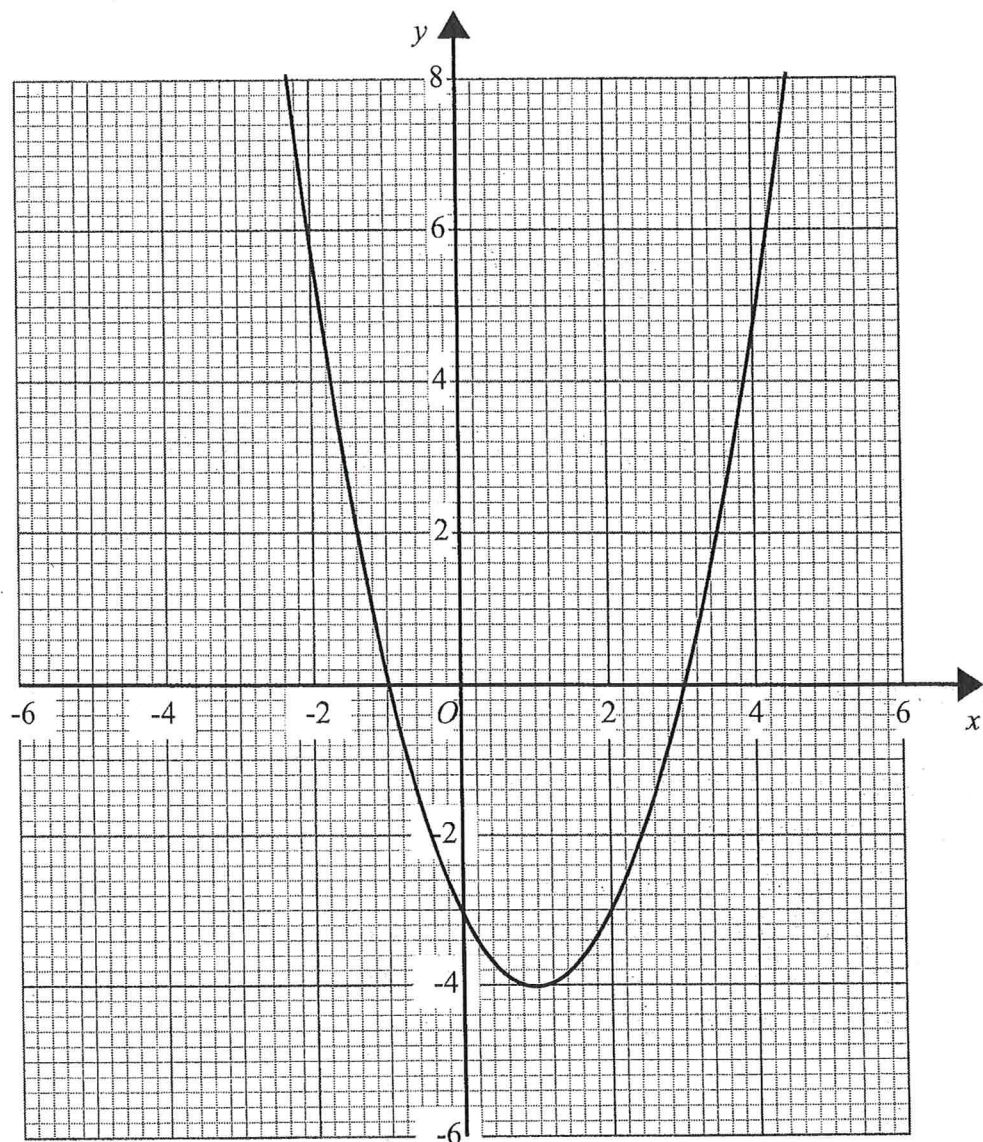
$$(x + 12)(x - 2) = 0$$

$$x = -12 \quad x = 2$$

$$x = -12 \text{ or } x = 2$$

(Total for Question 18 is 3 marks)

- 1 Here is the graph of $y = x^2 - 2x - 3$



- (a) Write down the turning point of the graph $y = x^2 - 2x - 3$

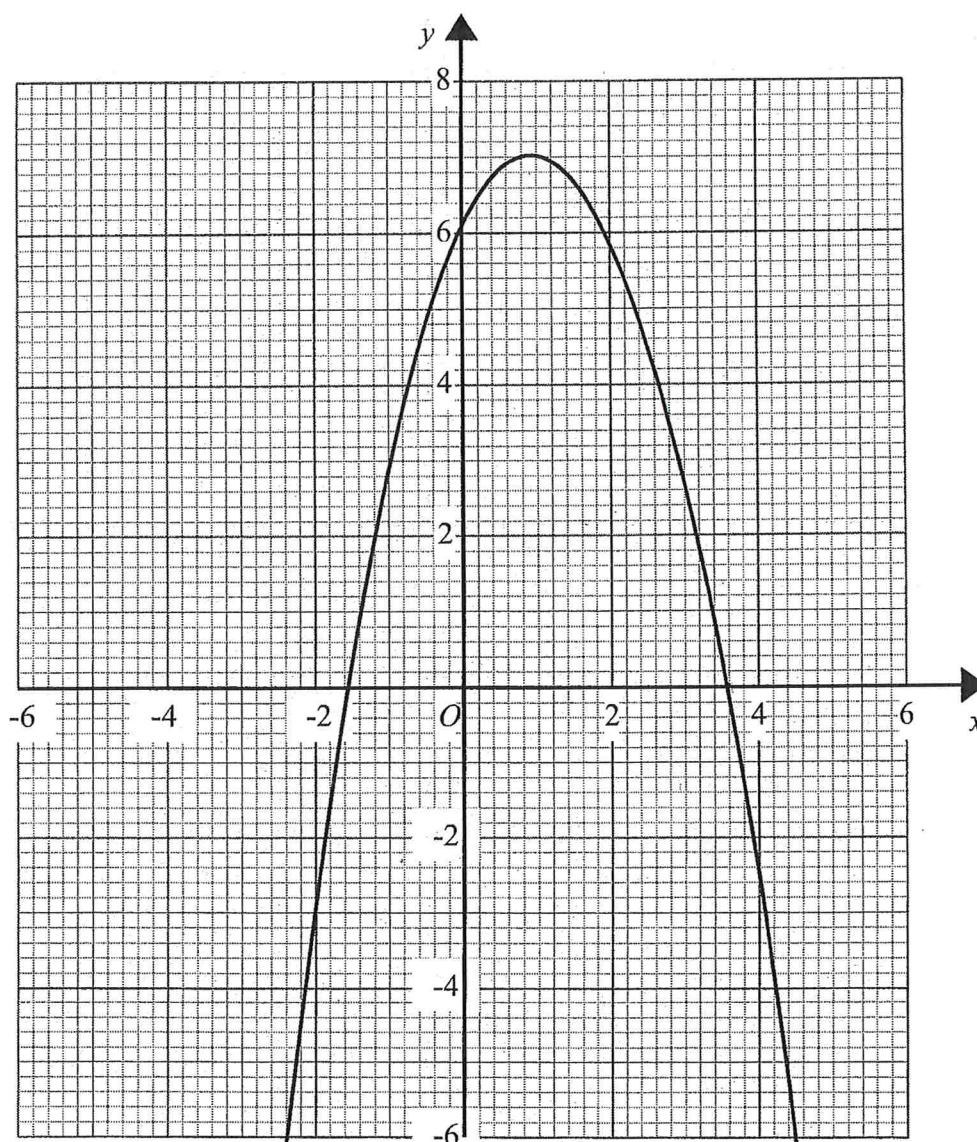
(.....1.....,-4.....)
(1)

- (b) Use the graph to find the roots of the equation $x^2 - 2x - 3 = 0$

.....-1 and 3.....
(2)

(Total for question 1 is 3 marks)

- 2 Here is the graph of $y = 2x + 6 - x^2$



- (a) Write down the turning point of the graph $y = 2x + 6 - x^2$

(.....1.....,7.....)
(1)

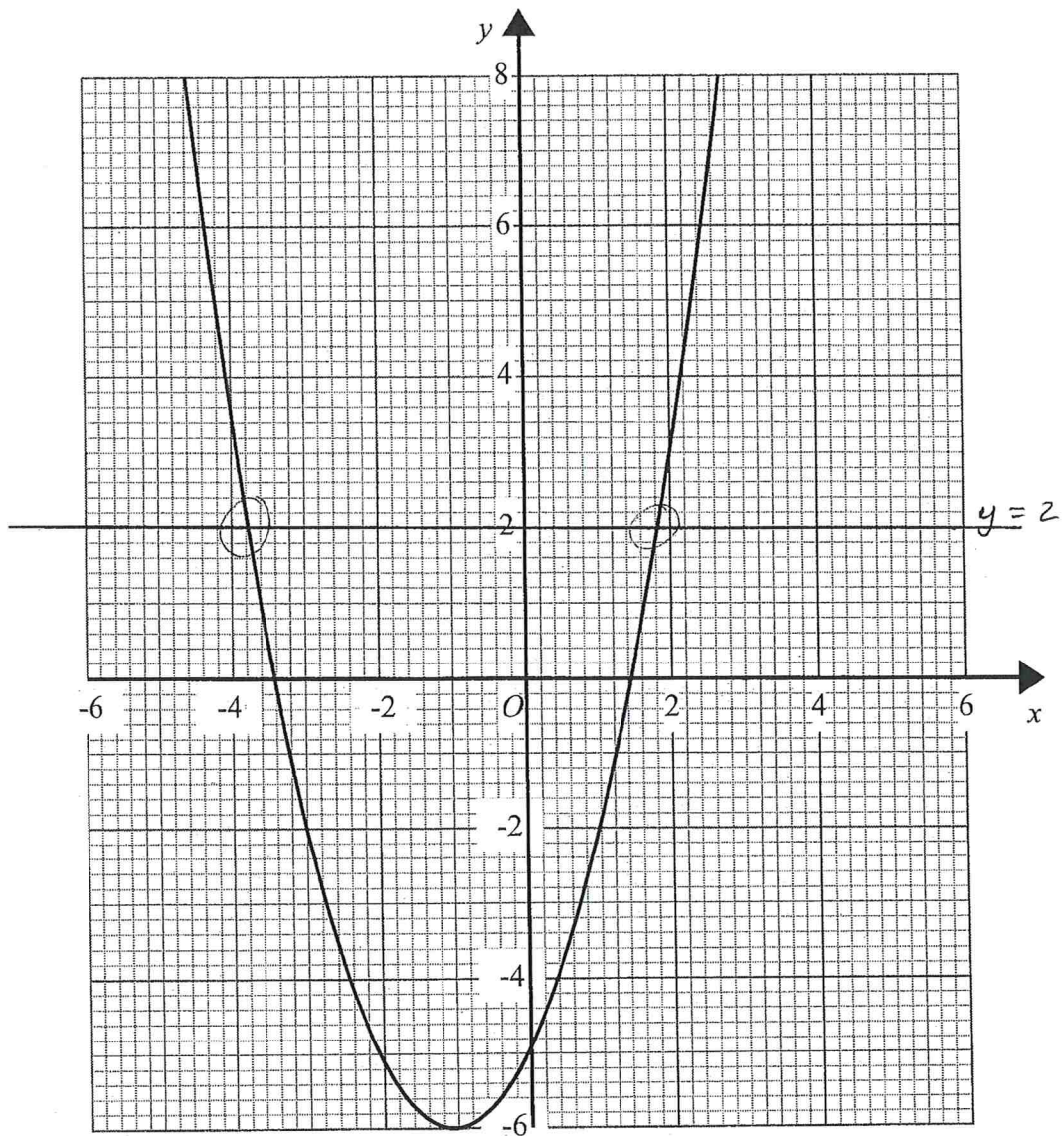
- (b) Use the graph to find the roots of the equation $x^2 = 2x + 6$

-1.6 and 3.6
.....
(2)

(Total for question 2 is 3 marks)

accept -1.5 to -1.5
3.5 to 3.6

3

Here is the graph of $y = x^2 + 2x - 5$ (a) Write down the turning point of the graph $y = x^2 + 2x - 5$

$(-1, -6)$
 (1)

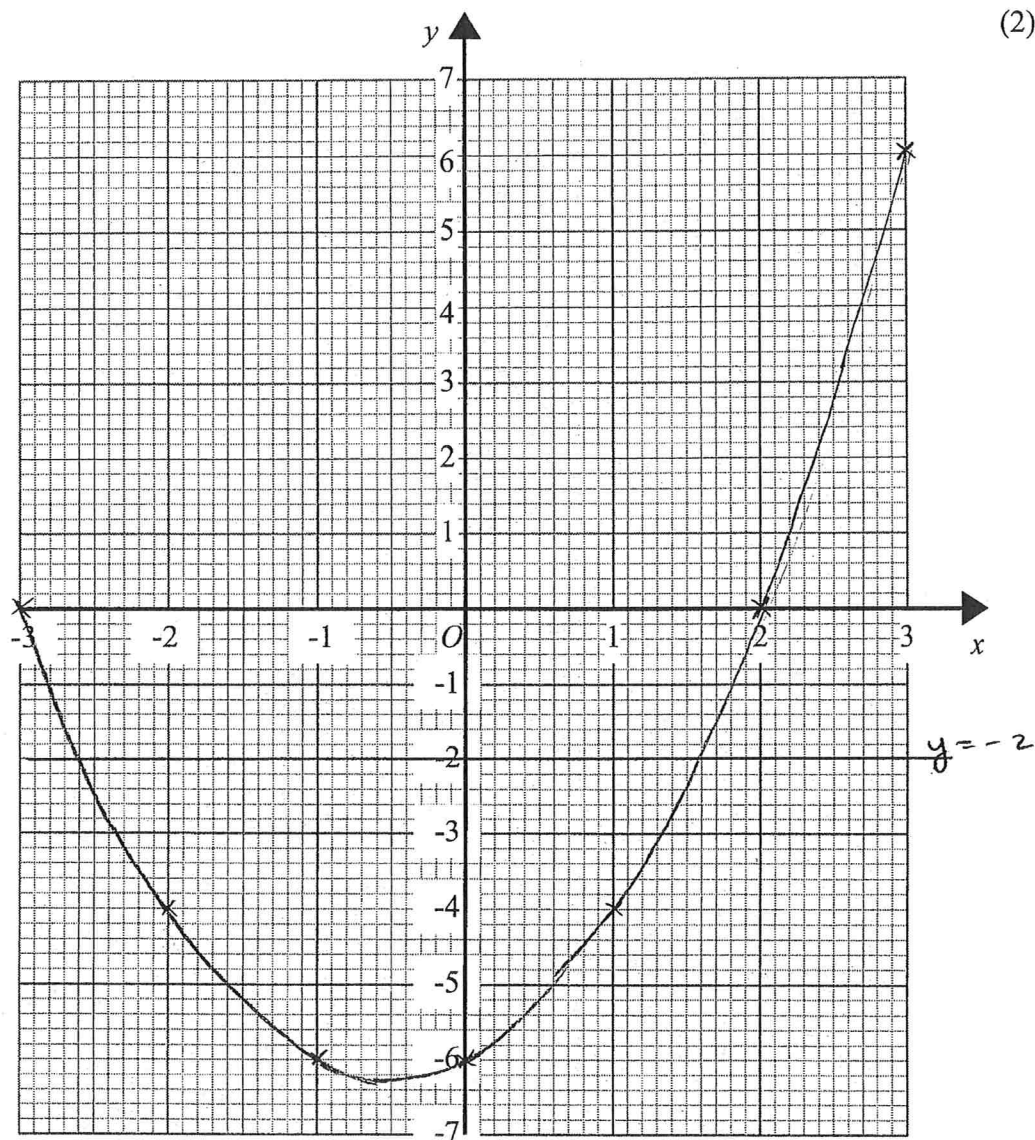
(b) Use the graph to find the roots of the equation $x^2 + 2x - 5 = 2$

$-3.8 \text{ and } 1.8$
 (2)

(Total for question 3 is 3 marks)

- 4 Complete the table of values for $y = x^2 + x - 6$

| | | | | | | | |
|-----|----|----|----|----|----|---|---|
| x | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| y | 0 | -4 | -6 | -6 | -4 | 0 | 6 |



- (a) On the grid draw the graph of $y = x^2 + x - 6$ for values of x from -3 to 3 (2)

- (b) Use the graph to find estimates of the solutions to the equation $x^2 + x - 6 = -2$

-2.6 and 1.6

(2)

(Total for question 4 is 6 marks)

-2.6 to -2.5

1.5 to 1.6

- 1 Here are the first five terms of a sequence.

$$\begin{array}{ccccccccc} 2 & & 4 & & 7 & & 11 & & 16 \\ & +2 & & +3 & & +4 & & +5 & \end{array}$$

Write down the next two terms in the sequence.

$$16 + 6 = 22$$

$$22 + 7 = 29$$

..... 22 , 29

(Total for Question 1 is 2 marks)

- 2 The first term in a sequence is 3.
The term to term rule is add 5.

3 8 13 18 23 ...

Is 97 a term in the sequence?

Give a reason for your answer.

No, all terms in the sequence end
in 3 or 8

(Total for Question 2 is 2 mark)

- 3 Here are the first five terms of a Fibonacci sequence

1 2 3 5 8

Write down the next two terms in the sequence.

$$5 + 8 = 13$$

$$8 + 13 = 21$$

..... 13 , 21

(Total for Question 3 is 2 marks)

- 4 The nth term of a sequence is $4n + 3$

(a) Find the first two terms of this sequence.

$$4(1) + 3 = 7$$

$$4(2) + 3 = 11$$

..... 7 , 11

(b) Is 35 a term in this sequence.

You must show how you get your answer.

$$4n + 3 = 35$$

$$4n = 32$$

$$n = 8$$

Yes, 35 is the 8th term in the
sequence

(Total for Question 4 is 2 marks)

5 The n th term of a sequence is $n^2 + 1$

$$(1)^2 + 1 = 2$$

(a) Find the first two terms of this sequence.

$$(2)^2 + 1 = 5$$

..... 2 5
(1)

(b) Is 35 a term in this sequence.

You must show how you get your answer.

$$n^2 + 1 = 35$$

$$n^2 = 34$$

$$n = \sqrt{34} \text{ [not a whole no.]}$$

..... No, 35 is not one more than a square
..... number
(1)

(Total for Question 5 is 2 marks)

6 Here are the first 5 terms of a sequence.

17

14

11

8

5

(a) Find the next term of this sequence.

..... 2
(1)

The n th term of a different sequence is $10n^2 + 5$

(b) Work out the 5th term of this sequence.

$$10(5)^2 + 5$$

$$10(25) + 5$$

$$250 + 5$$

..... 255
(1)

(Total for Question 6 is 2 marks)

7 Here are the first four terms of a sequence.

7

13

19

25

(a) Write down the next term in the sequence.

..... 31
(1)

(b) Explain how you got your answer

..... added 6 onto the previous term
(1)

(Total for Question 7 is 2 marks)

- 8 Here are the first four terms of a number sequence.

2 3 5 9

The rule to continue the sequence is
multiply the previous term by 2 and then subtract 1

Work out the 5th term of this sequence.

$$9 \times 2 = 18$$
$$18 - 1 = 17$$

17

(Total for Question 8 is 1 mark)

- 9 Here are the first 5 terms of a Fibonacci sequence.

2 2 4 6 10

Find the 8th term of this sequence.

$$6 + 10 = 16$$
$$10 + 16 = 26$$
$$16 + 26 = 42$$

42

(Total for Question 9 is 2 marks)

- 10 The n th term of a sequence is $n^2 + 3$

(a) Find the first three terms of this sequence.

$$(1)^2 + 3 = 4$$
$$(2)^2 + 3 = 7$$
$$(3)^2 + 3 = 12$$

4, 7, 12

(2)

(b) Find the 10th term in this sequence.

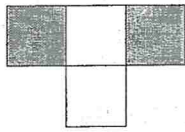
$$(10)^2 + 3$$
$$100 + 3$$

103

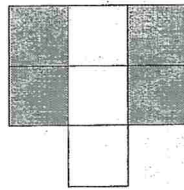
(1)

(Total for Question 10 is 3 marks)

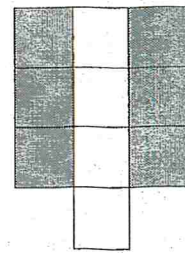
11 Here is a sequence of patterns made from white tiles and grey tiles.



pattern number 1

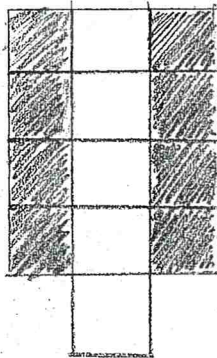


pattern number 2



pattern number 3

(a) In the space below, draw pattern number 4.



(1)

(b) Work out the total number of tiles to make pattern number 7.

4 7 10 13 16 19 22

..... 22

(2)

Kyle says

"There are 4 white tiles in pattern number 3 so there will be 8 white tiles in pattern number 6."

(c) Is Kyle right?

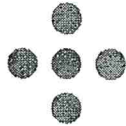
You must give a reason for your answer.

No. There will be 7 white tiles in pattern 6.

(1)

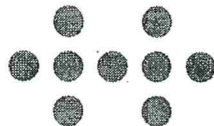
(Total for Question 11 is 4 marks)

12 Here is a sequence of patterns made from grey counters.



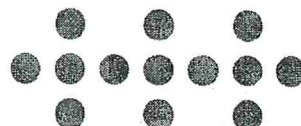
pattern number 1

5



pattern number 2

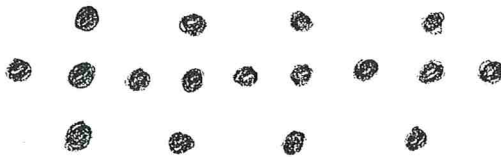
9



pattern number 3

13

(a) In the space below, draw pattern number 4.



(b) Work out the total number of counters to make pattern number 10.

(1)

5 9 13 17
4n 4 8 12 16

$4n + 1$

$4(10) + 1 = 41$

41

(2)

(Total for Question 12 is 3 marks)

13 Here are the first five terms of a sequence.

31

27

23

19

15

(a) Find the first negative term in the sequence.

11 7 3 -1

-1

(b) Is -30 a term in this sequence?
Give a reason for your answer.

(2)

No. All terms in the sequence are odd

(1)

(Total for Question 13 is 3 marks)

- 14 Here are the first 5 terms of an arithmetic sequence.

-3 1 5 9 13

- (a) Find an expression, in terms of n , for the n th term of this sequence.

$4n$ 4 8 12 16 20

$$4n - 7$$

(2)

The n th term of a different arithmetic sequence is $2n - 3$

- (b) Is 101 a term in this sequence?
Show how you get your answer.

$$2n - 3 = 101$$

$$2n = 104$$

$$n = 52$$

Yes, it is the 52nd term.

(2)

(Total for Question 14 is 4 marks)

- 15 Here are the first 5 terms of a sequence.

9 14 19 24 29

Find an expression, in terms of n , for the n th term of this sequence.

$5n$ 5 10 15 20 25

$$5n + 4$$

(Total for Question 15 is 2 marks)

- 16 Here are the first 5 terms of a sequence.

25 22 19 16 13

Find an expression, in terms of n , for the n th term of this sequence.

$-3n$ -3 -6 -9 -12 -15

$$-3n + 28$$

(Total for Question 16 is 2 marks)

- 17 Here are the first four terms of an arithmetic sequence.

4 11 18 25

Write down an expression, in terms of n , for the n th term of the sequence.

$7n$ 7 14 21 28

$7n - 3$

(Total for Question 17 is 2 marks)

- 18 Here are the first four terms of an arithmetic sequence.

35 31 27 23

Write down an expression, in terms of n , for the n th term of the sequence.

$-4n$ -4 -8 -12 -16

$-4n + 39$

(Total for Question 18 is 2 marks)

- 19 Here are the first five terms of an arithmetic sequence.

21 27 33 39 45

Write down an expression, in terms of n , for the n th term of the sequence.

$6n$ 6 12 18 24 30

$6n + 15$

(Total for Question 19 is 2 marks)

- 20 Here are the first five terms of an arithmetic sequence.

2 7 12 17 22

Write down an expression, in terms of n , for the n th term of the sequence.

$5n$ 5 10 15 20 25

$5n - 3$

(Total for Question 20 is 2 marks)

1 Change 2580 grams to kilograms.

..... 2.58 kg

(Total for question 1 is 1 mark)

2 Change 1.6 kilometres to metres.

..... 1600 m

(Total for question 2 is 1 mark)

3 Change 48 cm to mm.

..... 480 mm

(Total for question 3 is 1 mark)

4 Change 520 millilitres to litres

..... 0.52 litres

(Total for question 4 is 1 mark)

5 Change 0.87 kilograms to grams.

..... 870 grams

(Total for question 5 is 1 mark)

6 Change 640 cm to metres.

..... 6.4 metres

(Total for question 6 is 1 mark)

7 Change 25 metres to cm.

..... 2500 cm

(Total for question 7 is 1 mark)

8 Change 800 metres to kilometres.

..... 0.8 km

(Total for question 8 is 1 mark)

9 Change 75 mm to cm.

..... 7.5 cm

(Total for question 9 is 1 mark)

10 Change 2.5 litres to millilitres

..... 2500 millilitres

(Total for question 10 is 1 mark)

11 Change 920 millilitres to litres

..... 0.92 litres

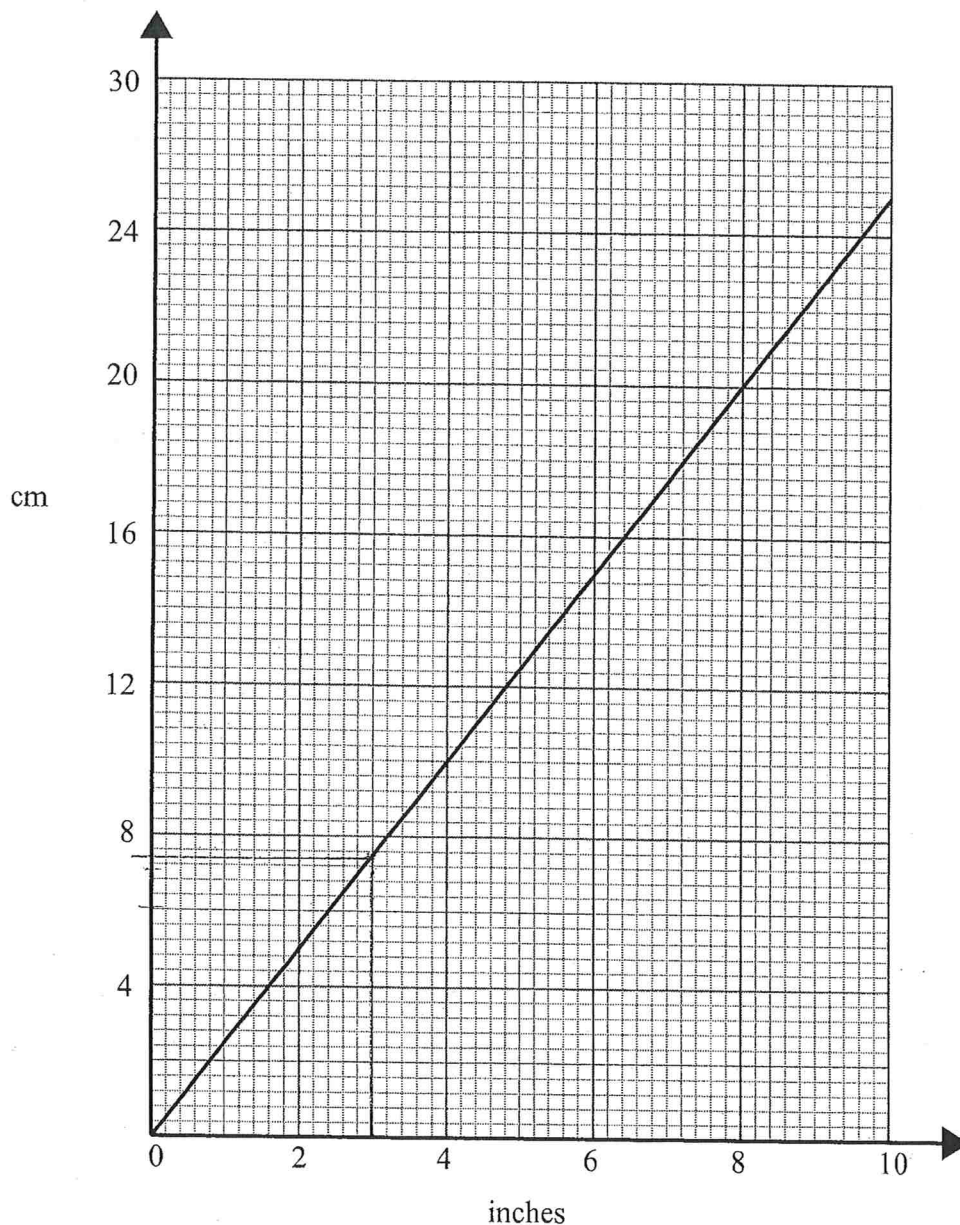
(Total for question 11 is 1 mark)

12 Change 75 kilograms to grams.

..... 75000 grams

(Total for question 12 is 1 mark)

- 13 You can use this graph to change between inches and centimetres.



- (a) Change 3 inches to cm.

- (b) Change 50 cm to inches

.....7.5..... cm
(1)
[7.4 - 7.6]

20 cm = 8 inches
10 cm = 4 inches
50 cm = 20 inches

.....20..... inches
(2)

(Total for question 13 is 3 marks)