Name: _____

GCSE (1 – 9)

Fractions of an Amount

Instructions

- Use **black** ink or ball-point pen.
- Answer all Questions.
- Answer the Questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The marks for each Question are shown in brackets
– *use this as a guide as to how much time to spend on each Question.*

Advice

- Read each Question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every Question.
- Check your answers if you have time at the end

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

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

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

135

(Total for question 6 is 2 marks)

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

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

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

56

(Total for question 7 is 2 marks)

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

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

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

160

(Total for question 8 is 2 marks)

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

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

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

60

(Total for question 9 is 2 marks)

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

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

$\frac{3}{7}$ 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.

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

$\frac{1}{4}$ 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**.

$\frac{1}{5}$ 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.

$\frac{1}{6}$ 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

$81 \div 9 = 9$

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

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

$25 - 18 = 7$

.....7.....

(Total for question 14 is 3 marks)

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

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

$32 \div 8 = 4$

$3 \times 4 = 12$

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

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

$2 \times 8 = 16$

$16 - 12 = 4$

.....4.....

(Total for question 15 is 3 marks)

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

20% of 90

10% = 9 [90 ÷ 10]

20% = 18 [9 × 2]

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

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

$7 \times 3 = 21$

$\frac{3}{7}$ 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

$$\begin{array}{r} {}^{8}\cancel{9}{}^{11}\cancel{2}4 \\ -\ 739 \\ \hline 185 \end{array}$$ Children

$$5\overline{)185} = 37$$

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

37 × 3 = 111

$\frac{3}{5}$ 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.

$1100 - 540 = 560$ (560 Boys)

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

$\frac{1}{8}$ 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.

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

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

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

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

He gives away

$20 + 15 = 35$

$50 - 35 = 15$

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.

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

$= 11.40$

$$\begin{array}{r} 11\,40 \\ 3\overline{)34^{1}20} \end{array}$$

$$\begin{array}{r} {}^{3}{}^{1} \\ 34\,20 \\ -\ 11\,40 \\ \hline 22\,80 \end{array}$$

£ 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.

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

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

Stan saves the rest of his income.

Work out how much Stan saves each month.

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

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

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

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

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

Stan spends: $800 + 200 + 300 = 1300$

Stan saves: $2000 - 1300 = 700$

£ 700

(Total for question 22 is 3 marks)

1 Write $\frac{12}{60}$ as a fraction in its simplest form.

$\frac{12}{60} = \frac{2}{10} = \frac{1}{5}$

$\frac{1}{5}$

(Total for Question 1 is 1 mark)

---

2 Write $\frac{18}{40}$ as a fraction in its simplest form.

$\frac{18}{40} = \frac{9}{20}$

$\frac{9}{20}$

(Total for Question 2 is 1 mark)

---

3 Write $\frac{28}{36}$ as a fraction in its simplest form.

$\frac{28}{36} = \frac{14}{18} = \frac{7}{9}$

$\frac{7}{9}$

(Total for Question 3 is 1 mark)

---

4 Write $\frac{6}{30}$ as a fraction in its simplest form.

$\frac{6}{30} = \frac{3}{15} = \frac{1}{5}$

$\frac{1}{5}$

(Total for Question 4 is 1 mark)

---

5 Write $\frac{72}{90}$ as a fraction in its simplest form.

$\frac{72}{90} = \frac{8}{10} = \frac{4}{5}$

$\frac{4}{5}$

(Total for Question 5 is 1 mark)

---

6 Write $\frac{28}{35}$ as a fraction in its simplest form.

$\frac{28}{35} = \frac{4}{5}$

$\frac{4}{5}$

(Total for Question 6 is 1 mark)

7 Here is a list of fractions.

$\frac{15}{20}$ $\frac{33}{44}$ $\frac{12}{16}$ $\frac{26}{32}$ $\frac{21}{28}$

One of these fractions is not equivalent to $\frac{3}{4}$

Write down this fraction.

$\frac{26}{32}$

(Total for Question 7 is 1 mark)

---

8 Here is a list of fractions.

$\frac{18}{45}$ $\frac{14}{30}$ $\frac{10}{25}$ $\frac{8}{20}$ $\frac{16}{40}$

One of these fractions is not equivalent to $\frac{2}{5}$

Write down this fraction.

$\frac{14}{30}$

(Total for Question 8 is 1 mark)

---

9 Here is a list of fractions.

$\frac{3}{9}$ $\frac{4}{12}$ $\frac{7}{21}$ $\frac{9}{27}$ $\frac{8}{26}$

One of these fractions is not equivalent to $\frac{1}{3}$

Write down this fraction.

$\frac{8}{26}$

(Total for Question 9 is 1 mark)

10 There are 26 sweets in a bag.

15 of the sweets are red.
The rest of the sweets are white.

What fraction of the sweets are red?

$\frac{15}{26}$

(Total for Question 10 is 1 mark)

---

11 There are 17 counters in a bag.

The table shows the number of counters of each colour.

Colour	Red	Blue	Yellow	Green
Number of Counters	7	2	5	3

What fraction of the counters are blue?

$\frac{2}{17}$

(Total for Question 11 is 1 mark)

---

12 There are 9 pens in a box.

5 pens are red.
The rest of the pens are green. $9 - 5 = 4$

What fraction of the pens are green?

$\frac{4}{9}$

(Total for Question 12 is 2 marks)

---

13 Last year the cost of Tom's train ticket was £42
This year the cost of Tom's train ticket increased to £50

Write down the increase in the cost of Tom's ticket as a fraction of last year's cost.

$50 - 42 = 8$

$\frac{8}{42}$ OR $\frac{4}{21}$

$\frac{8}{42}$

(Total for Question 13 is 2 marks)

14 Write the following fractions in order of size.
Start with the smallest fraction.

$\frac{1}{6}$ $\frac{4}{15}$ $\frac{1}{5}$ $\frac{1}{3}$ $\frac{7}{30}$

$\frac{5}{30}$ $\frac{8}{30}$ $\frac{6}{30}$ $\frac{10}{30}$ $\frac{7}{30}$

$\frac{1}{6}$ $\frac{1}{5}$ $\frac{7}{30}$ $\frac{4}{15}$ $\frac{1}{3}$

(Total for Question 14 is 2 marks)

15 Write the following fractions in order of size.
Start with the smallest fraction.

$\frac{19}{30}$ $\frac{5}{6}$ $\frac{2}{3}$ $\frac{11}{15}$ $\frac{3}{5}$

$\frac{25}{30}$ $\frac{20}{30}$ $\frac{22}{30}$ $\frac{18}{30}$

$\frac{3}{5}$ $\frac{19}{30}$ $\frac{2}{3}$ $\frac{11}{15}$ $\frac{5}{6}$

(Total for Question 15 is 2 marks)

16 Write the following fractions in order of size.
Start with the smallest fraction.

$\frac{11}{20}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{3}{5}$ $\frac{7}{10}$

$\frac{22}{40}$ $\frac{25}{40}$ $\frac{30}{40}$ $\frac{24}{40}$ $\frac{28}{40}$

$\frac{11}{20}$ $\frac{3}{5}$ $\frac{5}{8}$ $\frac{7}{10}$ $\frac{3}{4}$

(Total for Question 16 is 2 marks)

17 Write the following fractions in order of size.
Start with the smallest fraction.

$\frac{1}{3}$ $\frac{2}{9}$ $\frac{1}{4}$ $\frac{3}{16}$ $\frac{3}{10}$

0.3 0.2 0.25 0.1875 0.3

$\frac{3}{16}$ $\frac{2}{9}$ $\frac{1}{4}$ $\frac{3}{10}$ $\frac{1}{3}$

(Total for Question 17 is 2 marks)

18 Here are two fractions.

$\frac{7}{6}$ $\times 7$ $\quad$ $\frac{6}{7}$ $\times 6$

Work out which of the fractions is closer to 1
You must show your working.

$\frac{49}{42}$ $\quad$ $\frac{36}{42}$

$1 = \frac{42}{42}$

$\frac{49}{42} - \frac{42}{42} = \frac{7}{42}$ $\quad$ $\frac{42}{42} - \frac{36}{42} = \frac{6}{42}$

$\frac{6}{7}$ is closer to 1

(Total for Question 18 is 3 marks)

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19 Here are two fractions.

$\frac{3}{10}$ $\times 7$ $\quad$ $\frac{5}{7}$ $\times 10$

Work out which of the fractions is closer to $\frac{1}{2}$
You must show your working.

$\frac{21}{70}$ $\quad$ $\frac{50}{70}$

$\frac{1}{2} = \frac{35}{70}$

$\frac{35}{70} - \frac{21}{70} = \frac{14}{70}$ $\quad$ $\frac{50}{70} - \frac{35}{70} = \frac{15}{70}$

$\frac{3}{10}$ is closer to $\frac{1}{2}$

(Total for Question 19 is 3 marks)

1 Write down a multiple of 7 that is between 20 and 30

21 [or 28]

(Total for question 1 is 1 mark)

2 Write down the first even multiple of 9

18

(Total for question 2 is 1 mark)

3 Write down a multiple of 9 that is between 30 and 50

36, 45

36 [or 45]

(Total for question 3 is 1 mark)

4 Write down a prime number between 25 and 35

29 [or 31]

(Total for question 4 is 1 mark)

5 Write down two factors of 18

1, 18
2, 9 (Any 2)
3, 6

3 and 9

(Total for question 5 is 2 marks)

6 Write down all the prime numbers between 20 and 30

23 and 29

(Total for question 6 is 2 marks)

7 Write down two multiples of 10

10, 20, 30, 40, 50...

10 , 20

(Total for question 7 is 2 marks)

8 Here is a list of numbers.

15 19 25 31 35 39 40

From the numbers on the list,

(a) write down an even number

40

(1)

(b) write down a multiple of 7

35

(1)

(Total for question 8 is 2 marks)

9 Write down two multiples of 8

8, 16, 24, 32, 40...

8 , 16

(Total for question 9 is 2 marks)

10 Write down all the factors of 14

1, 14
2, 7

1, 2, 7 and 14

(Total for question 10 is 2 marks)

11 Write down all the factors of 20

1, 20
2, 10
4, 5

1, 2, 4, 5, 10 and 20

(Total for question 11 is 2 marks)

12 Here is a list of numbers.

30 31 32 33 34 35 36 37 38 39

From the numbers on the list,

(a) write down a square number

36

(1)

(b) write down a multiple of 8

32

(1)

(c) write down all of the prime numbers on the list.

31 and 37

(1)

(Total for question 12 is 3 marks)

13 Here is a list of numbers.

2 9 11 15 18 31 32

From the numbers on the list,

(a) write down a factor of 8

2

(1)

(b) write down a multiple of 6

18

(1)

(c) write down all of the prime numbers on the list.

2, 11 and 31

(1)

(Total for question 13 is 3 marks)

---

14 Write down all of the prime numbers between between 10 and 20

11, 13, 17 and 19

(Total for question 14 is 2 marks)

---

15 Write down two multiples of 20

20, 40, 60, 80, 100...

20 , 40

(Total for question 15 is 2 marks)

---

16 Write down all the factors of 16

1, 16
2, 8
4

1, 2, 4, 8 and 16

(Total for question 16 is 2 marks)

17 Ian says: "21 is a prime number"

Is Ian correct?
You must give a reason for your answer.

1, 21
3, 7

No 21 has four factors - prime numbers have only two factors

(Total for question 17 is 1 mark)

---

18 Here is a list of numbers.

3 5 9 16 19 27 28

From the numbers on the list,

(a) write down a factor of 12

3

(1)

(b) write down a multiple of 7

28

(1)

(c) write down all of the prime numbers on the list.

3, 5 and 19

(1)

(Total for question 18 is 3 marks)

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19 Gary is thinking of a number.
He says,

"My number is prime and it is a factor of 36"

There are two possible numbers Gary can be thinking of.

Write down these two numbers.

1, 36
2, 18
3, 12
4, 9
6

2 3

(Total for question 19 is 2 marks)

20 Write down two prime numbers that have a sum of 30

Prime numbers : 2, 3, 5, 7, 11, 13, 17, 19

23, 29

7 and 23

11 and 19

13 and 17

7 , 23

(Total for question 20 is 2 marks)

21 Write down two prime numbers that have a sum of 19

2 , 17

(Total for question 21 is 2 marks)

22 Here is a list of numbers.

8 12 15 17 23 27 32

From the numbers on the list,

(a) write down a factor of 16

8

(1)

(b) write down a multiple of 9

27

(1)

(c) write down all of the prime numbers on the list.

17 and 23

(1)

(Total for question 22 is 3 marks)

23 Barry is thinking of a number.
He says,

"My number is even. It is a factor of 30 and a multiple of 5"

There are two possible numbers Barry can be thinking of.

Write down these two numbers.

1, (30)
2, 15
3, (10)
5, 6

10 30

(Total for question 23 is 3 marks)

24 Paul is thinking of a number.
He says,

"My number is odd. It is a factor of 18 and a multiple of 3"

There are two possible numbers Paul can be thinking of.

Write down these two numbers.

1, 18
2, (9)
(3), 6

3 9

(Total for question 24 is 3 marks)

1 Work out 2^3

8

(Total for Question 1 is 1 mark)

2 Work out the cube root of 64

4

(Total for Question 2 is 1 mark)

3 Write down the value of $\sqrt{49}$

7

(Total for Question 3 is 1 mark)

4 Write down the value of 3^2

9

(Total for Question 4 is 1 mark)

5 Write down a square number that is also an even number.

ANY OF 4, 16, 36, 64, 100, 144...

4

(Total for Question 5 is 1 mark)

6 Write down the value of 5^2

25

(Total for Question 6 is 1 mark)

7 Work out 10^4

10000

(Total for Question 7 is 1 mark)

8 Write down the value of $\sqrt{36}$

6

(Total for Question 8 is 1 mark)

9 Work out 2^4

16

(Total for Question 9 is 1 mark)

10 Work out the cube root of 27

3

(Total for Question 10 is 1 mark)

11 Write down the value of $\sqrt{81}$

9

(Total for Question 11 is 1 mark)

12 Write down the value of 4^2

16

(Total for Question 12 is 1 mark)

13 Write down a square number that is also an odd number.

1, 9, 25, 49, 81, 121...

25

(Total for Question 13 is 1 mark)

14 Work out 5^3

125

(Total for Question 14 is 1 mark)

15 Write down the value of 8^2

64

(Total for Question 15 is 1 mark)

16 Work out the value of 5×10^3

5000

(Total for Question 16 is 1 mark)

17 Here is a list of numbers

4 6 8 11 12 15 16 25

From the list, write down all the numbers that are powers of 2.

4, 8 and 16

(Total for Question 17 is 1 mark)

18 Write $5 \times 5 \times 5 \times 5$ as a power of 5

5^4

(Total for Question 18 is 1 mark)

19 Here is a list of numbers

5 9 11 16 20 25 32 38

From the list, write down all the square numbers.

9, 16 and 25

(Total for Question 19 is 1 mark)

20 Here is a list of numbers

6 12 15 21 27 36 64 80

From the list, write down all the cube numbers.

27 and 64

(Total for Question 20 is 1 mark)

1 Find $\sqrt{1.69}$

1.3

(Total for question 1 is 1 mark)

2 Find 1.25^2

1.5625

(Total for question 2 is 1 mark)

3 Find $\sqrt{1.96 \times 2.25}$

2.1

(Total for question 3 is 1 mark)

4 Find $1.3^2 + 1.4^2$

3.65

(Total for question 4 is 1 mark)

5 Work out $(3.15 - 0.28)^2 - 4.076$

Write down all the figures on your calculator display.

4.1609

(Total for question 5 is 2 marks)

6 Work out $\dfrac{3.15 + 2.8^2}{2.06}$

Write down all the figures on your calculator display.

5.334951456

(Total for question 6 is 2 marks)

7 Work out $\dfrac{25.4 + 1.9^3}{6.5}$

Write down all the figures on your calculator display.

4.962923077

(Total for question 7 is 2 marks)

8 Use your calculator to work out $\dfrac{\sqrt{12.36 - 5.12}}{2.97^2}$

(a) Write down all the figures on your calculator display.

0.30503971136

(2)

(b) Write your answer to part (a) correct to 2 decimal places.

0.31

(1)

(Total for question 8 is 3 marks)

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9 Work out $\sqrt{\dfrac{25.1 - 3.87}{5.23 + 2.04}}$

Write down all the figures on your calculator display.

1.708865145

(Total for question 9 is 2 marks)

---

10 (a) Find the value of $30.5^2 + 12.1^2$

1076.66

(1)

(b) Find the value of $\sqrt{5.13 + 10.28} - 0.97$

2.955557285

(2)

(Total for question 10 is 3 marks)

---

11 Work out $\sqrt{12^2 + 15^2 - 54\cos(80)}$

Write down all the figures on your calculator display.

18.96372849

(Total for question 11 is 2 marks)

12 Use your calculator to work out $\dfrac{\sin 25^\circ + \cos 40^\circ}{\cos 25^\circ - \sin 40^\circ}$

(a) Write down all the figures on your calculator display.

4.510708504

(2)

(b) Write your answer to part (a) correct to 2 decimal places.

4.51

(1)

(Total for question 12 is 3 marks)

---

13 Use your calculator to work out $\sqrt{\dfrac{\tan 80^\circ + 1}{\tan 80^\circ - 1}}$

(a) Write down all the figures on your calculator display.

1.195051466

(2)

(b) Write your answer to part (a) correct to 3 significant figures.

1.20

(1)

(Total for question 13 is 3 marks)

---

14 Use your calculator to work out $\dfrac{12.74 + \sqrt{9.5}}{6.04 \times 4.1}$

(a) Write down all the figures on your calculator display.

0.638919681 9

(2)

(b) Write your answer to part (a) correct to 2 significant figures.

0.64

(1)

(Total for question 14 is 3 marks)

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 $a \times 2 \times 5$

10a

(1)

(b) Simplify $b \times b$

b^2

(1)

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

$\frac{8y}{2}$

4y

(1)

(Total for question 15 is 3 marks)

---

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

14st

(1)

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

4a − b

(2)

(Total for question 16 is 3 marks)

---

17 (a) Simplify $6f - f$

5f

(1)

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

$10x^2 + 3x$

(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 $a^2 + a^2 + a^2$

$3a^2$

(1)

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

$-3rs + 4rs$

rs

(1)

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

$-2a - 4$

(2)

(Total for question 21 is 4 marks)

---

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

$3n - n$

$2n$

(1)

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

$5xy - xy$

$4xy$

(1)

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

$3a + 6b + 6$

(2)

(Total for question 22 is 4 marks)

1 (a) Expand $7(2x + 7)$

$14x + 49$

(1)

(b) Factorise $3y + 12$

$3(y + 4)$

(1)

(Total for Question 1 is 2 marks)

---

2 (a) Expand $5a(a - 6)$

$5a^2 - 30a$

(2)

(b) Solve $4(b + 2) = 24$

$4b + 8 = 24$

$4b = 16$

$b = 4$

$b =$ 4

(2)

(Total for Question 2 is 4 marks)

---

3 (a) Factorise fully $12m + 8m^2$

$4m(3 + 2m)$

(2)

(b) Solve $3(n - 5) = 27$

$3n - 15 = 27$

$3n = 42$

$n = 14$

$n =$ 14

(2)

(Total for Question 3 is 4 marks)

4 (a) Expand $8(3s - 2)$

$24s - 16$

(1)

(b) Factorise $4t + 20$

$4(t + 5)$

(1)

(Total for Question 4 is 2 marks)

---

5 (a) Factorise fully $5a^2b + 15ab^2$

$5ab(a + 3b)$

(2)

(b) Solve $6(c - 8) = 42$

$6c - 48 = 42$

$6c = 90$

$c = 15$

$c =$ 15

(2)

(Total for Question 5 is 4 marks)

---

6 (a) Factorise $18x + 24$

$6(3x + 4)$

(1)

(b) Expand $3(2y - 4)$

$6y - 12$

(1)

(Total for Question 6 is 2 marks)

---

7 (a) Expand $p(p-3)$

$p^2 - 3p$

(1)

(b) Factorise $16q + 8$

$8(2q + 1)$

(1)

(Total for Question 7 is 2 marks)

---

8 (a) Factorise fully $6x^2 - 4xy$

$2x(3x - 2y)$

(2)

(b) Solve $2(w-4) = 13$

$2w - 8 = 13$

$2w = 21$

$w = \frac{21}{2}$

$w = \frac{21}{2}$ or 10.5

(2)

(Total for Question 8 is 4 marks)

---

9 (a) Factorise $x^2 - 9x$

$x(x - 9)$

(1)

(b) Expand $6(5y + 1)$

$30y + 6$

(1)

(Total for Question 9 is 2 marks)

10 (a) Expand $3(5x - 8)$

$15x - 24$

(1)

(b) Factorise $18y + 15$

$3(6y + 5)$

(1)

(Total for Question 10 is 2 marks)

---

11 (a) Expand $7(2h - 3)$

$14h - 21$

(1)

(b) Expand and Simplify $4(g + 5) + 3(g - 2)$

$4g + 20 + 3g - 6$

$7g + 14$

(2)

(Total for Question 11 is 3 marks)

---

12 (a) Factorise fully $7xy + 21x$

$7x(y + 3)$

(2)

(b) Solve $6(p + 3) = 42$

$6p + 18 = 42$

$6p = 24$

$p = 4$

$p = 4$

(2)

(Total for Question 12 is 4 marks)

13 (a) Expand $a(a + b)$

$a^2 + ab$

(1)

(b) Factorise $15y - 6$

$3(5y - 2)$

(1)

(Total for Question 13 is 2 marks)

---

14 (a) Expand $9x(3y - 8)$

$27xy - 72x$

(2)

(b) Expand and Simplify $7(t - 4) + 5(t - 2)$

~~$7t - 28 + 5t - 10$~~

$7t - 28 + 5t - 10$

$12t - 38$

(2)

(Total for Question 14 is 4 marks)

---

15 (a) Factorise fully $30x^3 + 12x$

$6x(5x^2 + 2)$

(2)

(b) Solve $5(f - 2) = 22$

$5f - 10 = 22$

$5f = 32$

$f = \frac{32}{5}$

$f = \frac{32}{5}$ or 6.4

(2)

(Total for Question 15 is 4 marks)

16 (a) Expand $x(8x + 1)$

$8x^2 + x$

(1)

(b) Factorise $18 + 63y$

$9(2 + 7y)$

(1)

(Total for Question 16 is 2 marks)

---

17 (a) Expand $2x^2(4x - 9)$

$8x^3 - 18x^2$

(2)

(b) Expand and Simplify $6(y + 3) - 5(y - 4)$

$6y + 18 - 5y + 20$

$y + 38$

(2)

(Total for Question 17 is 4 marks)

---

18 (a) Factorise fully $30a^2 + 40ab$

$10a(3a + 4b)$

(2)

(b) Solve $3(g + 9) = 21$

$3g + 27 = 21$

$3g = -6$

$g = -2$

$g = -2$

(2)

(Total for Question 18 is 4 marks)

19 (a) Expand $n(5n + 1)$

$5n^2 + n$

(1)

(b) Factorise $18m + mn$

$m(18 + n)$

(1)

(Total for Question 19 is 2 marks)

---

20 (a) Expand $3x(7x^2 - y)$

$21x^3 - 3xy$

(2)

(b) Expand and Simplify $3(6y + 5) - 2(4y - 1)$

$18y + 15 - 8y + 2$

$10y + 17$

(2)

(Total for Question 20 is 4 marks)

---

21 (a) Factorise fully $18a^2bc + 30abc^2$

$6abc(3a + 5c)$

(2)

(b) Expand and Simplify $4(2y - 7) - 3(5y - 3)$

$8y - 28 - 15y + 9$

$-7y - 19$

(2)

(Total for Question 21 is 4 marks)

1 $f = 7$
$g = 5$

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

$3(7) + 2(5)$
$21 + 10$

31

(Total for Question 1 is 2 marks)

---

2 $c = 4d - 7$

Find the value of c when $d = 6$

$c = 4(6) - 7$
$= 24 - 7$
$= 17$

17

(Total for Question 2 is 2 marks)

---

3 $v = u + at$

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

Work out the value of v.

$v = 3 + 10(6)$
$= 3 + 60$
$= 63$

$v =$ 63

(Total for Question 3 is 2 marks)

---

4 $x = 4$
$y = 6$

Work out the value of $3x - y$

$3(4) - 6$
$12 - 6$
6

6

(Total for Question 4 is 2 marks)

5 $L = 9m + 2n$

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

$L = 9(3) + 2(-6)$

$= 27 - 12$

$= 15$

15

(Total for Question 5 is 2 marks)

6 $q = 5p + 3r$

$p = 6$
$r = -4$

Work out the value of q.

$q = 5(6) + 3(-4)$

$= 30 - 12$

$= 18$

18

(Total for Question 6 is 2 marks)

7 $H = 4f + g$

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

$H = 4(5) - 2$

$= 20 - 2$

$= 18$

18

(Total for Question 7 is 2 marks)

8 $A = 4p + 5q$

$p = 3$
$q = -2$

Work out the value of A.

$A = 4(3) + 5(-2)$

$= 12 - 10$

$= 2$

2

(Total for Question 8 is 2 marks)

9 $L = 9m + 2n$

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

$L = 9(-3) + 2(4)$

$= -27 + 8$

$= -19$

-19

(Total for Question 9 is 2 marks)

---

10 $q = 6p - r$

$p = -4$
$r = 5$

Work out the value of q.

$q = 6(-4) - 5$

$= -24 - 5$

$= -29$

-29

(Total for Question 10 is 2 marks)

---

11 $H = f - 2g$

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

$H = 12 - 2(-6)$

$= 12 + 12$

$= 24$

24

(Total for Question 11 is 2 marks)

---

12 $A = 5p + 6q$

$p = 10$
$q = -2$

Work out the value of A.

$A = 5(10) + 6(-2)$

$= 50 - 12$

$= 38$

38

(Total for Question 12 is 2 marks)

13 $L = m(n - 2)$

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

$L = 9(5 - 2)$
$= 9(3)$
$= 27$

27

(Total for Question 13 is 2 marks)

14 $a = 5bc$

$b = -4$
$c = -3$

Work out the value of a.

$a = 5(-4)(-3)$
$= -20(-3)$
$= 60$

60

(Total for Question 14 is 2 marks)

15 $x = 4y^2 - 12$

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

$x = 4(5)^2 - 12$
$= 4(25) - 12$
$= 100 - 12$
$= 88$

88

(Total for Question 15 is 2 marks)

16 $A = p - 2q$

$p = -4$
$q = -7$

Work out the value of A.

$A = -4 - 2(-7)$
$= -4 + 14$
$= 10$

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 $h=8$

$A = \frac{1}{2}(3)(8)$

$= \frac{1}{2}(24)$

$= 12$

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 $h=10$

$A = \frac{1}{2}(7+6)(10)$

$= \frac{1}{2}(13)(10)$

$= \frac{1}{2}(130) = 65$

65

(Total for Question 22 is 2 marks)

23 $v=u+at$

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

$v = 12 + (-6)(5)$

$= 12 - 30$

$= -18$

-18

(Total for Question 23 is 2 marks)

24 $y=mx+c$

$m=-2$
$x=12$
$c=-7$

Work out the value of y.

$y = -2(12) + (-7)$

$= -24 - 7$

$= -31$

-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.

$s = 3(4) + \frac{1}{2}(2)(4)^2$

$= 12 + \frac{1}{2}(2)(16)$

$= 12 + 16$

$= 28$

$s =$ 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.

$s = (-5)(3) + \frac{1}{2}(4)(3)^2$

$= -15 + \frac{1}{2}(4)(9)$

$= -15 + 2(9)$

$= -15 + 18$

$= 3$

$s =$ 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.

$s = \frac{(7)^2 - (5)^2}{2(3)}$

$= \frac{49 - 25}{6}$

$= \frac{24}{6}$

$= 4$

$s =$ 4

(Total for Question 27 is 2 marks)

1 $f = 5c - 8$

Make c the subject of the formula.

$f = 5c - 8$

$+8 \qquad +8$

$\frac{f+8}{5} = \frac{5c}{5}$

$c = \frac{f+8}{5}$

$c = \frac{f+8}{5}$

(Total for question 1 is 2 marks)

2 $u = 4t - 21$

Make t the subject of the formula.

$u = 4t - 21$

$+21 \qquad +21$

$\frac{u+21}{4} = \frac{4t}{4}$

$t = \frac{u+21}{4}$

$t = \frac{u+21}{4}$

(Total for question 2 is 2 marks)

3 $x = 3y - 2$

Make y the subject of the formula.

$x = 3y - 2$

$+2 \qquad +2$

$\frac{x+2}{3} = \frac{3y}{3}$

$y = \frac{x+2}{3}$

$y = \frac{x+2}{3}$

(Total for question 3 is 2 marks)

4 $m = 5n + 2p$

Make p the subject of the formula.

$$m = 5n + 2p$$
$$-5n \quad -5n$$
$$\frac{m - 5n}{2} = \frac{2p}{2}$$
$$p = \frac{m - 5n}{2}$$

$p = \frac{m - 5n}{2}$

(Total for question 4 is 2 marks)

5 $a = 3c - 2$

Make c the subject of the formula.

$$a = 3c - 2$$
$$+2 \quad +2$$
$$\frac{a + 2}{3} = \frac{3c}{3}$$
$$c = \frac{a + 2}{3}$$

$c = \frac{a + 2}{3}$

(Total for question 5 is 2 marks)

6 $P = 3a + 3b$

Make a the subject of the formula.

$$p = 3a + 3b$$
$$-3b \quad -3b$$
$$\frac{p - 3b}{3} = \frac{3a}{3}$$
$$a = \frac{p - 3b}{3}$$

$a = \frac{p - 3b}{3}$

(Total for question 6 is 2 marks)

7 Make n the subject of $m = n^2 + 3$

$$m = n^2 + 3$$
$$-3 \qquad -3$$
$$m - 3 = n^2$$
$$n = \pm\sqrt{m-3}$$

accept $n = \sqrt{m-3}$

$n = \pm\sqrt{m-3}$

(Total for question 7 is 2 marks)

8 Make a the subject of $v = u + at$

$$v = u + at$$
$$-u \qquad -u$$
$$\frac{v-u}{t} = \frac{at}{t}$$
$$a = \frac{v-u}{t}$$

$a = \dfrac{v-u}{t}$

(Total for question 8 is 2 marks)

9 Make a the subject of $v^2 = u^2 + 2as$

$$v^2 = u^2 + 2as$$
$$-u^2 \qquad -u^2$$
$$\frac{v^2-u^2}{2s} = \frac{2as}{2s}$$
$$a = \frac{v^2-u^2}{2s}$$

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

(Total for question 9 is 2 marks)

10 Make b the subject of $a = \sqrt{\frac{b+2}{5}}$

$$a^2 = \left(\sqrt{\frac{b+2}{5}}\right)^2$$

$$5 \times a^2 = \frac{b+2}{5} \times 5$$

$$5a^2 = b + 2$$

$$-2 \qquad -2$$

$$5a^2 - 2 = b$$

$b = 5a^2 - 2$

(Total for question 10 is 3 marks)

---

11 Make b the subject of $A = 3b + 9$

$$A = 3b + 9$$

$$-9 \qquad -9$$

$$\frac{A - 9}{3} = \frac{3b}{3}$$

$$b = \frac{A - 9}{3}$$

$b = \frac{A-9}{3}$

(Total for question 11 is 2 marks)

12 Make x the subject of $y = 3x - 2$

$y = 3x - 2$

$+2 \qquad +2$

$\frac{y+2}{3} = \frac{3x}{3}$

$x = \frac{y+2}{3}$

$x = \frac{y+2}{3}$

(Total for question 12 is 2 marks)

13 Make x the subject of $y = \frac{1}{2}x + 6$

$y = \frac{1}{2}x + 6$

$-6 \qquad -6$

$y - 6 = \frac{1}{2}x$

$\times 2 \qquad \times 2$

$2(y-6) = x$

OR $x = 2y - 12$

$x = 2(y-6)$

(Total for question 13 is 2 marks)

14 Make x the subject of $y = \frac{2}{5}x - 12$

$y = \frac{2}{5}x - 12$

$+12 \qquad +12$

$y + 12 = \frac{2}{5}x$

$\times 5 \qquad \times 5$

$\frac{5(y+12)}{2} = \frac{2x}{2}$

$x = \frac{5(y+12)}{2}$

$x = \frac{5(y+12)}{2}$

(Total for question 14 is 3 marks)

15 Make x the subject of $5x + 6y + 12 = 0$

$-6y \quad -6y$

$5x + 12 = -6y$

$-12 \quad -12$

$5x = -6y - 12$

$x = \frac{-6y - 12}{5}$

$x = \frac{-6y - 12}{5}$

(Total for question 15 is 2 marks)

16 Make x the subject of $y = x^3 - 5$

$+5 \quad +5$

$y + 5 = x^3$

$x = \sqrt[3]{y + 5}$

$x = \sqrt[3]{y + 5}$

(Total for question 16 is 2 marks)

17 Make x the subject of $y = \frac{2x + 3}{4}$

$\times 4 \qquad \times 4$

$4y = 2x + 3$

$-3 \qquad -3$

$\frac{4y - 3}{2} = \frac{2x}{2}$

$x = \frac{4y - 3}{2}$

$x = \frac{4y - 3}{2}$

(Total for question 17 is 3 marks)

18 Make a the subject of $x = 3(a + 9)$

$x = 3a + 27$

$-27 \qquad -27$

$\frac{x - 27}{3} = \frac{3a}{3}$

$a = \frac{x - 27}{3}$

OR $a = \frac{x}{3} - 9$

$a = \frac{x - 27}{3}$

(Total for question 18 is 2 marks)

19 $a = \frac{3 + c}{b}$

Make b the subject of the formula.

$ab = 3 + c$

$b = \frac{3 + c}{a}$

$b = \frac{3 + c}{a}$

(Total for question 19 is 2 marks)

20 $d = \sqrt{\frac{3h}{2}}$

Make h the subject of the formula.

$d^2 = \frac{3h}{2}$

$\frac{2d^2}{3} = \frac{3h}{3}$

$h = \frac{2d^2}{3}$

$h = \frac{2d^2}{3}$

(Total for question 20 is 3 marks)

1 An adult cinema ticket costs £x
The price of a child's ticket is half the price of an adult ticket

Write an expression for the price, in pounds, of a child's ticket.

£ $\frac{x}{2}$

(Total for Question 1 is 1 mark)

2 Charles has m marbles.
Rosalind has 6 more marbles than Charles

Write an expression for the number of marbles Rosalind has.

$m + 6$

(Total for Question 2 is 1 mark)

3 A cup of tea costs £t
A cup of coffee costs £c

Write an expression, in pounds, for the cost of 5 cups of tea and 4 cups of coffee.

£ $5t + 4c$

(Total for Question 3 is 1 mark)

4 Albert is given n sweets.
He eats 5 of the sweets.
Write an expression for the number of sweets Albert now has.

$n - 5$

(Total for Question 4 is 1 mark)

5 Michael is paid £x for each hour he works.
One week Michael works for 20 hours.

Write an expression for the total amount, in pounds, Michael is paid for this week.

£ $20x$

(Total for Question 5 is 1 mark)

6 Alex has b bags of marbles.
Each bag contains m marbles.

Write an expression, in terms of b and m, for the total number of marbles Alex has.

bm

(Total for Question 6 is 1 mark)

7 A train takes t minutes to get from London to Canterbury

The same journey by car takes 50 minutes longer.

Write an expression for the amount of time, in minutes, it takes to travel from London to Canterbury by car.

$t + 50$ minutes

(Total for Question 7 is 1 mark)

8 A school charges £5 for tickets to a show.

The school raises £x in total from ticket sales.

Write an expression for the total number of tickets sold by the school.

$\frac{x}{5}$

(Total for Question 8 is 1 mark)

9 Isaac is x years old.
Marie is twice as old as Isaac.
Write an expression for Marie's age.

$2x$

(Total for Question 9 is 1 mark)

10 Apples costs 30p each.

Write an expression for the cost of a apples.

$30a$ pence

(Total for Question 10 is 1 mark)

11 Stephen is n years old.

Rachel is 10 years older than Stephen

(a) Write an expression for Rachel's age.

$n + 10$

(1)

Tim is 13 years younger than Stephen.

(b) Write an expression for Tim's age.

$n - 13$

(1)

(c) Write an expression for the total age of Stephen, Rachel and Tim.

$n + n + 10 + n - 13$

$3n - 3$

(2)

(Total for Question 11 is 4 marks)

12 Tea bags are sold in small boxes and large boxes.
There are 100 tea bags in a small box.
There are 240 tea bags in a large box.

Mae buys x small boxes and y large boxes of tea bags.

Write an expression for the total number of tea bags Mae buys.

$100x + 240y$

(Total for Question 12 is 2 marks)

---

13 In Rugby Union a team scores:
5 points for each try
2 points for each conversion
3 points for each penalty

A team scores t tries, c conversions and p penalties.

Write an expression for the total number of points the team scores.

$5t + 2c + 3p$

(Total for Question 13 is 2 marks)

---

14 Apples cost 25p each.
Bananas cost 20p each.

The total cost of a apples and b bananas is C.

Write a **formula** for the total cost of a apples and b bananas.

$C = 25a + 20b$ ~~pence~~

(Total for Question 14 is 2 marks)

15 A child's ticket to see a show costs £x
An adult's ticket costs £5 more than a child's ticket.

(a) Write an expression for the price, in pounds, of an adults ticket.

£ $x + 5$

(b) Write an expression for the cost of one adult's ticket and two child's tickets. **(1)**

$x + 5 + 2x$

£ $3x + 5$

(2)

(Total for Question 15 is 3 marks)

16 A shop sells toilet rolls in small packs and big packs.
There a 4 toilet rolls in a small pack.
There are 9 toilet rolls in a big pack.

The shop has s small packs and b big packs of toilet roll.

(a) Write an expression for the **total number of packs** of toilet roll the shop has.

$s + b$

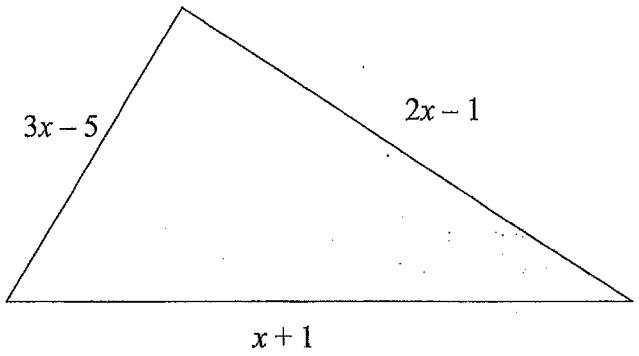
(b) Write an expression for the total number of toilet rolls the shop has. **(1)**

$4s + 9b$

(2)

(Total for Question 16 is 3 marks)

1 The lengths, in cm, of the sides of a triangle are $3x - 5$, $2x - 1$ and $x + 1$



(a) Write down an expression, in terms of x, for the perimeter of the triangle.

$3x - 5 + 2x - 1 + x + 1$

$6x - 5$ cm

(2)

The perimeter of the triangle is 31 cm.

(b) Work out the value of x.

$6x - 5 = 31$

$6x = 36$

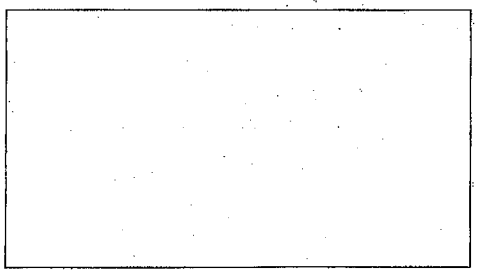
$x = 6$

6 [cm]

(2)

(Total for question 1 is 4 marks)

2 A rectangle has a length of $(2x + 3)$ cm and a width of $(x + 5)$ cm.



(a) Find an expression for the perimeter of the rectangle.

$2(2x + 3) + 2(x + 5)$

$4x + 6 + 2x + 10$

$6x + 16$

$6x + 16$ cm

(2)

(b) Given the rectangle has a perimeter of 43 cm find the value of x.

$6x + 16 = 43$

$6x = 27$

$x = \frac{27}{6} = \frac{9}{2} = 4.5$

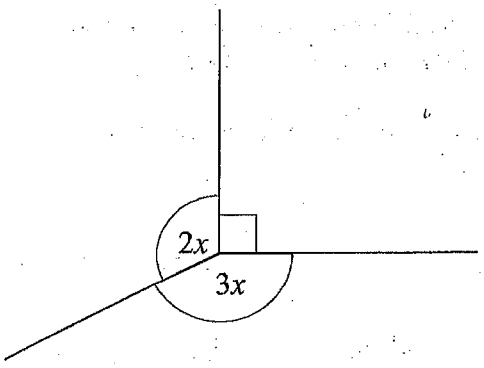
4.5 [cm]

(2)

(Total for question 2 is 4 marks)

(or $\frac{9}{2}$)

3



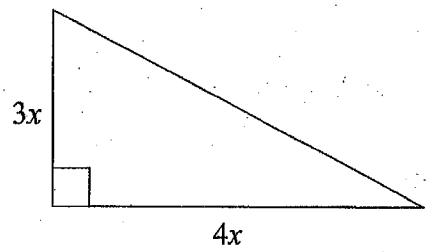
Find the value of x.

$$2x + 3x + 90 = 360$$
$$5x + 90 = 360$$
$$5x = 270$$
$$x = 54$$

54°

(Total for question 3 is 3 marks)

4 The diagram shows a right angled triangle.



The area of the triangle is 294 cm^2

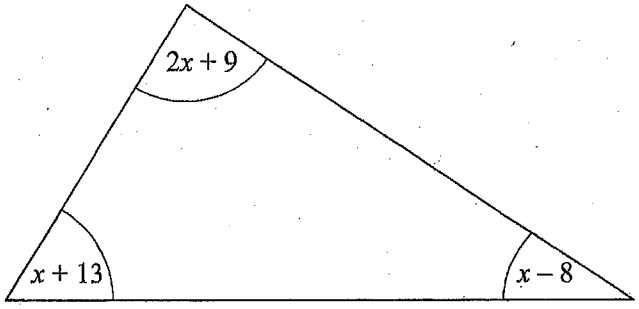
Work out the value of x.

$$\frac{1}{2} \times 4x \times 3x = 294$$
$$\frac{1}{2} \times 12x^2 = 294$$
$$6x^2 = 294$$
$$x^2 = \frac{294}{6} = \frac{147}{3} = 49$$
$$x = \sqrt{49}$$
$$= 7$$

7 [cm]

(Total for question 4 is 3 marks)

5 The sizes of the angles, in degrees, of a triangle are $2x + 9$, $x + 13$ and $x - 8$



Work out the value of x.

$2x + 9 + x - 8 + x + 13 = 180$

$4x + 14 = 180$

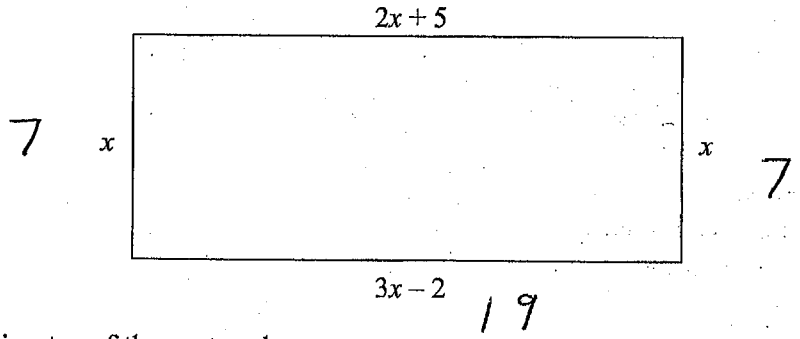
$4x = 166$

$x = \frac{166}{4} = \frac{83}{2} = 41.5$

41.5 or $\frac{83}{2}$

(Total for question 5 is 3 marks)

6 The diagram shows a rectangle.
All measurements are in centimetres.



Find the perimeter of the rectangle.

$2x + 5 = 3x - 2$

$5 = x - 2$

$7 = x$

$2(7) + 5 = 19$

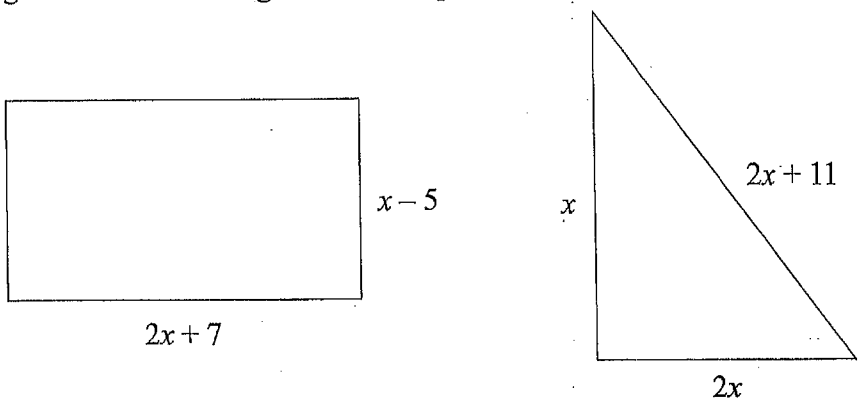
$2(19) + 2(7)$

$38 + 14$

52 cm

(Total for question 6 is 3 marks)

7 The diagram shows a rectangle and a triangle.



The perimeter of the rectangle is equal to the perimeter of the triangle.

Find the value of x.

$2(x-5) + 2(2x+7) = x + 2x + 2x + 11$

$2x - 10 + 4x + 14 = 5x + 11$

$6x + 4 = 5x + 11$

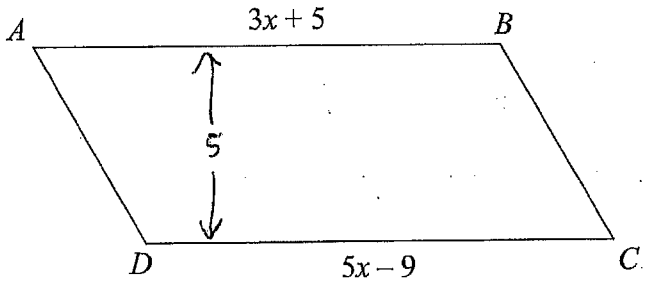
$x + 4 = 11$

$x = 7$

7

(Total for question 7 is 3 marks)

8



ABCD is a parallelogram
All measurements are in centimetres.
The perpendicular height of the parallelogram is 5 cm.

Find the area of *ABCD*

$3x + 5 = 5x - 9$

$5 = 2x - 9$

$14 = 2x$

$x = 7$

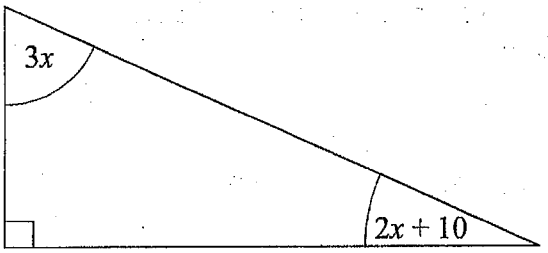
$3(7) + 5 = 26$

26×5

130 cm^2

(Total for question 8 is 4 marks)

9 The diagram shows a right-angled triangle.
All of the angles are in degrees.



Find the value of size of the smallest angle in the triangle.

$3x + 2x + 10 + 90 = 180$

$5x + 100 = 180$

$5x = 80$

$x = 16$

$3(16) = 48 \qquad 2(16) + 10 = 42$

42 °

(Total for question 9 is 3 marks)

10 Adam has some marbles.
Bradley has twice as many marbles are Adam.
Chris has 5 more marbles than Bradley.

In total they have 55 marbles.

How many marbles does Chris have?

Adam $= x$

Bradley $= 2x$

Chris $= 2x + 5$

$x + 2x + 2x + 5 = 55$

$5x + 5 = 55$

$5x = 50$

$x = 10$

$2(10) + 5 = 25$

25

(Total for question 10 is 3 marks)

3x x

11 The size of the largest angle in a triangle is three times the size of the smallest angle.
The other angle is 35° more than the smallest angle.

x + 35

Work out, in degrees, the size of each angle in the triangle.
You must show your working.

$3x + x + x + 35 = 180$

$5x + 35 = 180$

$5x = 145$

$x = 29$

$29 + 35 = 64$

$3(29) = 87$

29° , 64° , 87°

(Total for question 11 is 5 marks)

3x x

12 Lucy is three times as old as Alex.
Lucy is 7 years older than Megan.
The sum of their ages is 126.

Find the ratio of Alex's age to Lucy's age to Megan's age.

Alex = x

Lucy = 3x

Megan = 3x − 7

$x + 3x + 3x - 7 = 126$

$7x - 7 = 126$

$7x = 133$

$x = 19$

$3(19) = 57$

$57 - 7 = 50$

19 : 57 : 50

(Total for question 12 is 4 marks)