

- 1 The points A , B , C and D lie in order on a straight line.

$$AB:BD = 1:5$$

$$AC:CD = 7:11$$

Work out $AB:BC:CD$

..... : :

(Total for Question 1 is 3 marks)

- 2 There are some small cubes and some large cubes in a bag.
The cubes are red or the cubes are yellow.

The ratio of the number of small cubes to the number of large cubes is $4:7$

The ratio of the number of red cubes to the number of yellow cubes is $3:5$

- (a) Explain why the least possible number of cubes in the bag is 88

(1)

All the small cubes are yellow.

- (b) Work out the least possible number of large yellow cubes in the bag.

(3)

(Total for Question 2 is 4 marks)

3 There are four types of cards in a game.

Each card has a black circle or a white circle or a black triangle or a white triangle.



number of cards with a black shape : number of cards with a white shape = 3 : 5

number of cards with a circle : number of cards with a triangle = 2 : 7

Express the total number of cards with a black shape as a fraction of the total number of cards with a triangle.

(Total for Question 3 is 3 marks)

4 Given that

$$x^2 : (3x + 5) = 1 : 2$$

find the possible values of x .

(Total for Question 4 is 4 marks)

5 The ratio $(y + x) : (y - x)$ is equivalent to $k : 1$

Show that $y = \frac{x(k + 1)}{k - 1}$

(Total for Question 5 is 3 marks)

- 6 White shapes and black shapes are used in a game.
Some of the shapes are circles.
All the other shapes are squares.

The ratio of the number of white shapes to the number of black shapes is $3:7$

The ratio of the number of white circles to the number of white squares is $4:5$

The ratio of the number of black circles to the number of black squares is $2:5$

Work out what fraction of all the shapes are circles.

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(Total for Question 6 is 4 marks)

7 7 kg of carrots and 5 kg of tomatoes cost a total of 480p

cost of 1 kg of carrots : cost of 1 kg of tomatoes = 5 : 9

Work out the cost of 1 kg of carrots and the cost of 1 kg of tomatoes.

carrotsp

tomatoesp

(Total for Question 7 is 4 marks)

8 p and q are two numbers such that $p > q$

When you subtract 5 from p and subtract 5 from q the answers are in the ratio 5 : 1

When you add 20 to p and add 20 to q the answers are in the ratio 5 : 2

Find the ratio $p : q$

Give your answer in its simplest form.

(Total for Question 8 is 5 marks)

9 The ratio of Marta's hourly pay to Khalid's hourly pay is 6 : 5

Both Marta and Khalid get an increase of £1.50 in their hourly pay.

The ratio of Marta's hourly pay to Khalid's hourly pay after this increase is 13 : 11

Work out the hourly pay before the increase for Marta and for Khalid.

Marta £.....

Khalid £.....

(Total for Question 9 is 4 marks)

10 $5c + d = c + 4d$

(a) Find the ratio $c : d$

.....
(2)

$6x^2 = 7xy + 20y^2$ where $x > 0$ and $y > 0$

(b) Find the ratio $x : y$

.....
(3)

(Total for Question 10 is 5 marks)

11 $2a:5c = 6:25$
 $4b:7c = 20:21$

Show that $a + b:b + c = 17:20$

(Total for Question 11 is 3 marks)

12 Given that

$$2x - 1 : x - 4 = 16x + 1 : 2x - 1$$

find the possible values of x .

(Total for Question 12 is 5 marks)

13

Given that $\frac{2x^2 + y^2}{4x^2 - y^2} = \frac{43}{11}$ where $x > 0$ and $y > 0$

find, in its simplest form, the ratio $x:y$

.....
(Total for Question 13 is 4 marks)

14 There is a total of y counters in a box.

There are x pink counters and 5 blue counters in the box.
The rest of the counters are green.

$$x:y = 1:3$$

Freda takes at random two counters from the box.

Find, in terms of x , an expression for the probability that Freda takes two counters of the same colour.

Give your answer as a fraction in the form $\frac{ax^2 + bx + c}{dx^2 + ex}$ where a, b, c, d and e are integers.

(Total for Question 14 is 5 marks)