

1 Write as a fraction in its simplest form.

(a) 72%

..... [1]

(b) 0.004

..... [1]

2 Write 0.00273 in standard form.

..... [1]

3 Calculate $4.9 \times 10^{-3} + 8.1 \times 10^{-4}$.
Give your answer in standard form.

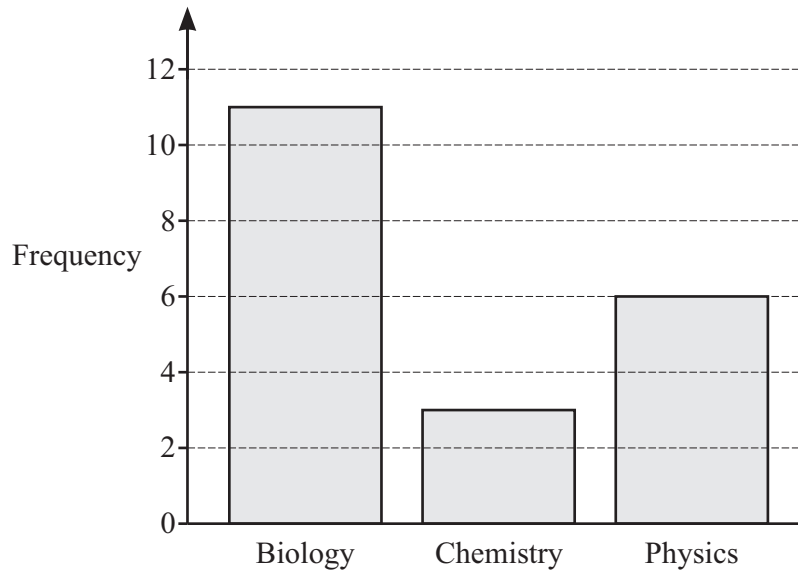
..... [1]

4 **Without using a calculator**, work out $1\frac{2}{3} \div 7\frac{1}{2}$.

You must show all your working and give your answer as a fraction in its simplest form.

..... [3]

- 5 20 students choose their favourite science subject.
The results are shown in the bar chart.



- (a) Work out how many more students choose biology than physics.

..... [1]

- (b) Write down the fraction of students whose favourite science subject is chemistry.

..... [1]

- (c) One of the 20 students is picked at random.

Write down the probability that this student did **not** choose biology.

..... [2]

- (d) Only **one** of the averages, median, mode and mean can be found for these results.

- (i) Write down the average that can be found.

..... [1]

- (ii) Find this average for these results.

..... [1]

- (iii) Explain why the range cannot be found.

..... [1]

- 6 In triangle PQR , $PR = 5$ cm and $QR = 4$ cm.

Using a ruler and compasses only, construct triangle PQR .

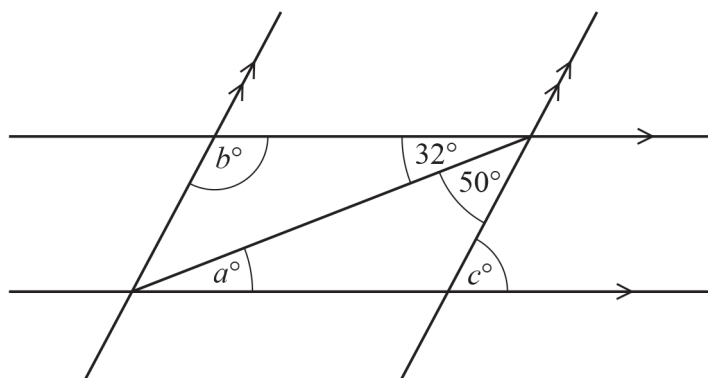
Leave in your construction arcs.

The side PQ has been drawn for you.



[2]

7



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The diagram shows two pairs of parallel lines.

Find the value of a , the value of b and the value of c .

$a =$

$b =$

$c =$ [3]

- 8** Write 180 as a product of its prime factors.

..... [2]

- 9** Simplify $3x^3 \times 4x^4$.

..... [2]

- 10** $9^{24} \div 9^w = 9^5$

Find the value of w .

$w =$ [1]

- 11** Simplify.

$$\sqrt{16x^2} \times 5y^0$$

..... [2]

12 $2^p = \frac{1}{8^4}$

Find the value of p .

$p = \dots\dots\dots$ [2]

13 Simplify the following. Show your working.

(a) $\sqrt{120}$

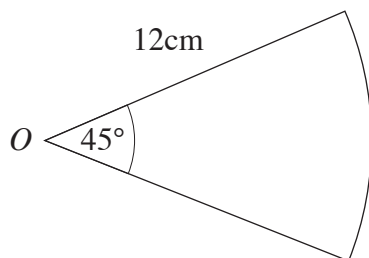
$\dots\dots\dots$ [1]

14 Rationalize the denominator.
Give your answer in its simplest form.

(a) $\frac{9}{\sqrt{3}}$

$\dots\dots\dots$ [2]

15 The diagram shows a sector of a circle, center O .
Find the length of the arc and give your answer in multiples of π .



$\dots\dots\dots$ [2]

- 15** Round 15.9612 to 3 significant figures.

..... [1]

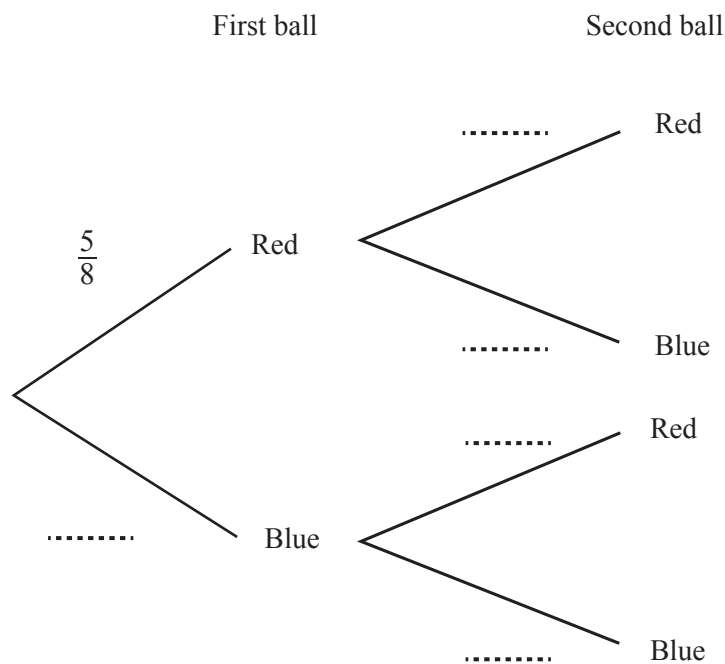
- 16** Factorize the following

$$7a^2b + 21ab^3$$

..... [2]

- 17** A bag contains 5 red balls and 3 blue balls.
Sophie takes a ball at random, notes its colour and then puts it back in the bag.
She does this a second time.

- (a)** Complete the tree diagram.



[2]

- (b)** Work out the probability that both of the balls she takes are blue.

..... [2]