

1. Lucy loves chocolate. She buys a box of chocolates for £7.85 and two bars of chocolate with hazelnut, costing £1.83 each.

How much change should she get if she pays with a £20 note?

2. Fill in the missing numbers in each of the following number sequences.

a. 7, 15, 25, 37, _____, _____, ...

b. 1, 1, 2, 3, 5, 8, _____, _____, ...

c. _____, 5, 4, 10, 2, 20, 1, 40, 0.5, _____, ...

d. 84, 42, 21, 10.5, _____, _____, ...

e. _____, $1, \frac{3}{4}, \frac{9}{16}, \frac{27}{64},$ _____, ...

3. A factory produces drawing pins that are packaged in small boxes.

Each box has a label stating “Average contents: 50 drawing pins”.

The quality control department in the factory take a sample of 10 boxes and count the contents of each box. Here are their results:

<i>Number of drawing pins</i>	<i>Number of boxes</i>
49	1
50	4
51	2
52	3

a. What is the mode?

b. What is the median?

c. What is the mean?

d. Does the sample provide sufficient evidence to support the claim on the label? Give a reason for your answer.

4. Five whole numbers have a mean of 10 and a mode of 8. The largest and smallest numbers are both multiples of 7. Find the numbers.

5. The name BENJAMIN is written repeatedly a very large number of times in a continuous line.

The beginning looks like this:

BENJAMINBENJAMINBENJAMINBE...

a. What is the 18th letter?

b. What is the 44th letter?

c. What is the 192nd letter?

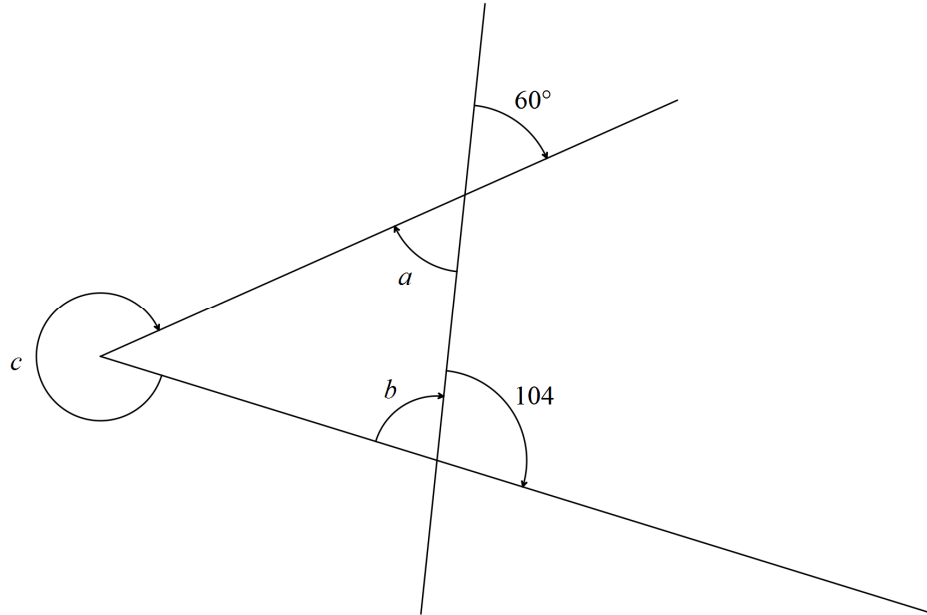
d. A letter is chosen at random from this sequence of letters. What is the probability that the letter chosen will be an N?

6. Zainab thinks of a number. She multiplies it by 5, then adds 2. Her answer is $17\frac{1}{2}$.
What number did she think of?

7. David has a job that pays £6.50 per hour. He is offered a job by a different company that pays 12% more and he decides to accept the new job. What will his new pay be?

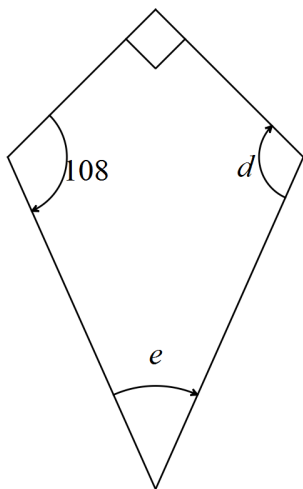
8. A TV normally costs £540 but is reduced by £189 in the sales. What is the percentage reduction?

9. The diagram contains three straight lines. Calculate the size of angles a , b and c . The diagram is not to scale.



Angle $a =$ _____ Angle $b =$ _____ Angle $c =$ _____

10. Work out the size of angles d and e in the kite below. The diagram is not to scale.

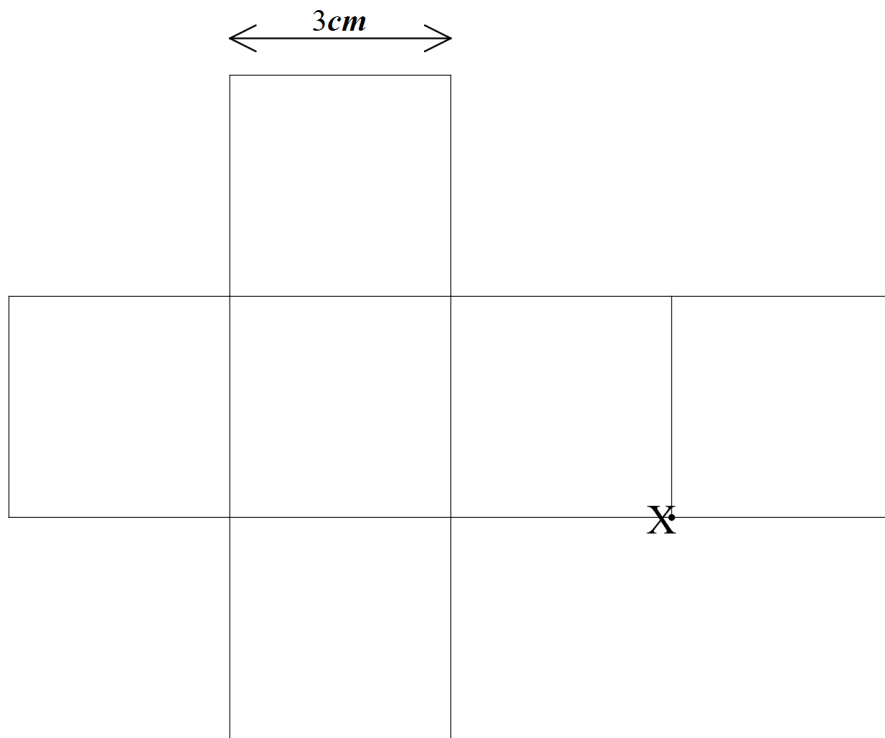


Angle $d =$ _____

Angle $e =$ _____

11. Here is the net of a cube.

- a. The point labelled X is joined to another point on the net to make a vertex of the cube. Label this point Y.



- b. The net is cut out of a rectangular tin sheet measuring 15 cm by 9 cm. 6cm^2 of the tin sheet were used to make flaps.

What area of tin sheet was wasted in making this net?

12. Sasha, Leah, Sophie and Eve race each other. There are no tied positions.

Leah comes last.

Sophie finishes in front of Sasha and Eve.

Eve finishes before Sasha.

Work out the remaining finishing positions:

1st place: _____

2nd place: _____

3rd place: _____

4th place: _____ Leah _____

13. Ania has a bag of sweets. In her bag there are some pear drops, some mint humbugs and at least 2 sherbet lemons.

The probability of Ania choosing a pear drop at random is $\frac{3}{5}$.

a. Based on the information above, what is the smallest number of pear drops there can be in the bag?

In fact, Ania knows that there are 21 pear drops in the bag and there are 6 more humbugs than sherbet lemons.

b. How many sherbet lemons and how many humbugs are there?

Number of humbugs = _____

Number of sherbet lemons = _____

14. A cuboid has faces with areas of 12, 21 and 28 cm².

What is the volume of the cuboid? Show your method clearly.

15. You are given that:

1 inch is equal to 2.54 cm

1 foot is equal to 12 inches

Calculate the height in centimetres of a person who is 6 feet tall.

Give your answer correct to the nearest cm.

16. British shoe manufacturers make shoes about 0.8 inch longer than the foot they are designed to fit.

Shoes are made in whole and half number sizes e.g. size 6, $6\frac{1}{2}$, 7, and so on.

A rule for working out a male or female shoe size is given by the following rules:

$$\text{UK male shoe size} = 3 \times (f + 0.8) - 24.5$$

$$\text{UK female shoe size} = 3 \times (f + 0.8) - 21.5$$

where f is the foot length in inches.

For example, a man with a foot length of 9.6 inches would have a foot size of 6.7.

As this is between sizes $6\frac{1}{2}$ and 7, he should try on shoes of both sizes.

Which of the two sizes fits best depends on other factors such as the width of his foot and the style of shoe.

- a. Show that the foot size of a man with foot length of 9.6 inches is 6.7.
- b. Ndidu wears size 7 female size shoes. Assuming that the shoes are a very good fit, work out her likely foot length, in inches.

17. You are given that $f(x, y) = 3x + 2y$,

For example, $f(4, 7) = 3 \times 4 + 2 \times 7 = 26$

a. Find $f(8, 2)$.

b. If $f(x, 12) = 39$, find the value of x .

c. If $f(a, a) = 40$, find the value of a .

18. It takes 10 minutes to fill a bath when using both the hot and cold tap at the same time.

Water flows from the cold tap at twice the rate of the hot tap.

How long would it take to fill the bath when using just the cold tap?

19. A triangle has vertices A, B and C.

A is the point (5,7)

B is the point (8.5, 10)

C is the point (-3, 1).

The triangle is reflected in the y-axis to make a new triangle with vertices A', B' and C'.

Write down the co-ordinates of A', B' and C'.

A' is (,)

B' is (,)

C' is (,).

20. In the following sum, each letter represents a different digit. Calculate the value of each digit.

$$\begin{array}{r} A \\ A \\ + B B \\ \hline C C C \\ \hline \end{array}$$

$A =$ _____ $B =$ _____ $C =$ _____