Crossover Maths Starter

Quick 10

1) 13.2×4.3

2) Share £132 in the ratio 7: 4

3) Decrease 80 by 30%

4) $5 - 28 \div 7 + \sqrt{49}$

5) A recipe for 8 biscuits needs 120g of flour. How much flour is needed for 12 biscuits?

6) Expand $3(x - 7)$

7) Solve $8x - 5 = 43$

8) Factorise $9x + 12$

9) What is the LCM of 3 and 7

10) $\frac{2}{3} + \frac{5}{7}$

Need to know formulae/facts

How do you find the median for a list of numbers?

Use of a calculator

Calculate

$$\tan^{-1}\left(\frac{2}{5}\right)$$

Functional:

Richard is going to cover a bathroom wall with tiles.
The wall is in the shape of a rectangle.

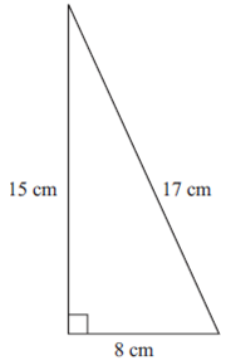
The wall is 1.8 m long and 2.4 m high.

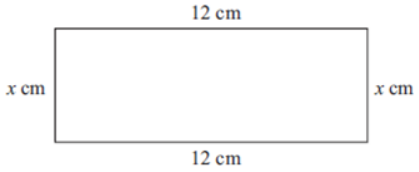
The tiles are squares with sides of 30 cm.
There are 14 tiles in a box.

How many boxes of tiles does Richard need?
You must show all your working.

Problem Solving:

The diagrams show a right-angled triangle and a rectangle.





The area of the right-angled triangle is **equal** to the area of the rectangle.
Find the value of x.

Crossover Maths Starter

Quick 10 – Recall

1) 44.2×7.4

2) Share £120 in the ratio 2: 5: 1

3) Decrease 70 by 90%

4) $10 - 70 \div 7 + \sqrt{64}$

5) A recipe for 4 biscuits needs 90g of flour. How much flour is needed for 10 biscuits?

6) Expand $x(x - 5)$

7) Solve $4x - 5 = -25$

8) Factorise fully $8x + 12$

9) What is the LCM of 8 and 7

10) $\frac{3}{8} + \frac{5}{7}$

Need to know formulae/facts

11^2, 12^2, 13^2, 14^2, 15^2

Use of a calculator

Calculate

$$\sin^{-1}\left(\frac{2}{5}\right)$$

Fahima buys

2 packets of bread rolls costing £1.50 for each packet
1 bottle of ketchup costing £1.60
3 packets of sausages

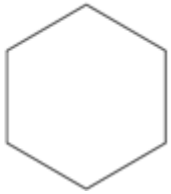
Fahima pays with a £10 note.
She gets 30p change.

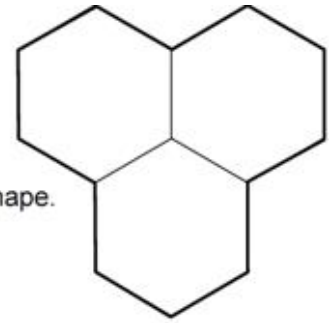
Fahima works out that one packet of sausages costs £2.30

Is Fahima right?
You must show how you get your answer.

Problem Solving:

This hexagon has a perimeter of 24 cm.





Three of the hexagons are used to make this shape.

What is the perimeter of the shape?

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Crossover Maths Starter

10

Quick 10 – Recall

1) 26.2×7.3

2) Share £120 in the ratio 7: 2: 3

3) Decrease 72 by 25%

4) $12 - 35 \div 5 + \sqrt{100}$

5) A recipe for 4 biscuits needs 50g of flour. How much flour is needed for 10 biscuits?

6) Expand $4x(x - 5)$

7) Solve $8x - 5 = 75$

8) Factorise fully $8x + 16$

9) What is the LCM of 6 and 9

10) $\frac{1}{6} + \frac{5}{9}$

Functional:

Sean works for a company.
His normal rate of pay is £12 per hour.

When Sean works more than 8 hours a day, he is paid overtime for each hour he works more than 8 hours.

Sean's rate of overtime pay per hour is $1\frac{1}{4}$ times his normal rate of pay per hour.

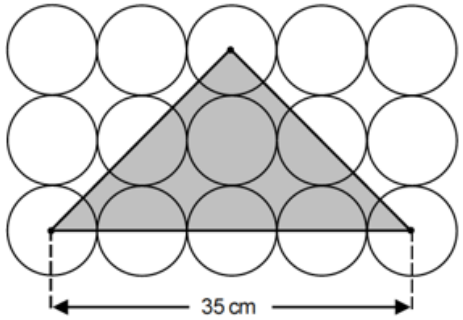
On Monday Sean worked for 10 hours.

Work out the total amount of money Sean earned on Monday.

Problem Solving:

The diagram shows 15 identical circles, arranged as a rectangle, and a shaded triangle.

The vertices of the triangle are at the centre of circles.



Calculate the area of the shaded triangle.

Need to know formulae/facts

First 5 cube numbers

Use of a calculator

Calculate

$\sin^{-1}\left(\frac{3}{8}\right)$

Crossover Maths Starter

Quick 10 – Recall

1) 17.2×7.9

2) Share £120 in the ratio 4: 1: 3

3) Increase 70 by 20%

4) $10 - 35 \div 7 + \sqrt{4}$

5) £1 = \$1.30.
Convert £300 into dollars

6) Expand $3x(y - 2)$

7) Solve $3x - 5 = 10$

8) Factorise $9x + 15$

9) What is the LCM of 8 and 12

10) $\frac{1}{8} + \frac{5}{12}$

Need to know formulae/facts

Prime numbers between 10 and 20

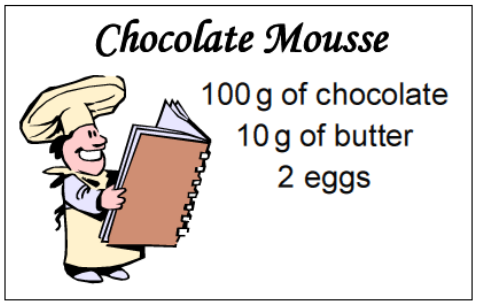
Use of a calculator

Calculate

$\cos^{-1}\left(\frac{3}{8}\right)$

Functional: **Chocolate Mousse**

Here is a recipe for chocolate mousse:



This makes enough chocolate mousse for two people.

I have 8 eggs, 45 g of butter and 350 g of chocolate.

What is the maximum number of people I can make chocolate mousse for?

Problem Solving:

Double Trouble

Use all the digits

0 1 5 0 1 5 0

to complete this multiplication:

$\square\square\square \times 2 = \square\square\square\square$

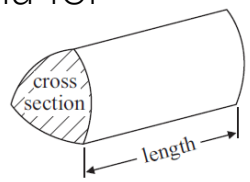
Crossover Maths Starter

Quick 10 – Recall

1) 4.5×12
2) Share £30 in the ratio 1: 3
3) Decrease 160 by 35%
4) Round 159 to 1sf
5) Estimate 9.7×2.75
6) Expand $5x(x + 3)$
7) Solve $10x + 3 = 62$
8) What is the LCM of 9 and 15
9) $10 - 2^2 \times 3 - 5$
10) $\frac{3}{8}$ of 48

Need to know formulae

What is the formula for volume of a prism



Functional:

Mr Brown and his 2 children are going to London by train.
An adult ticket costs £24
A child ticket costs £12
Mr Brown has a Family Railcard which gets him 30% off.

Work out the total cost of the tickets when Mr Brown uses his Family Railcard.

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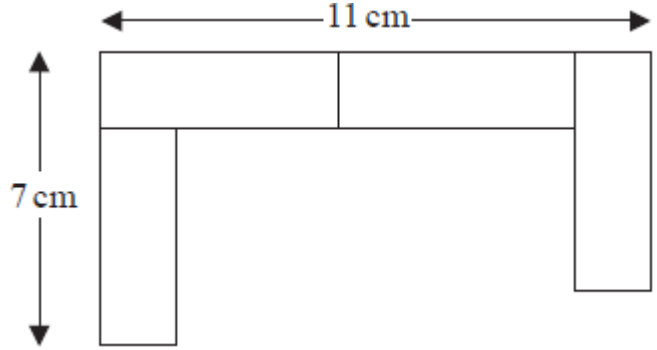
Problem Solving:

A pattern is made using identical rectangular tiles



Find the total area of the pattern

Crossover Maths Starter

Quick 10 – Recall

1) 4.7×6.3

2) Share £63 in the ratio 7: 2

3) Decrease 90 by $\frac{2}{3}$

4) $12 - 20 \div 5 + \sqrt{16}$

5) 7 pens cost 56p. How much would 11 pens cost?

6) Expand $3x^2(x + 1)$

7) Solve $4x + 11 = 3$

8) What is the LCM of 12 and 20

9) Factorise fully $20x^3 + 12x$

10) $\frac{7}{9} - \frac{2}{5}$

Need to know formulae/facts

Area of a triangle?

Use of a calculator

Calculate

$$\frac{2.6}{\sqrt{31} + 1.2}$$

Functional:

Three companies sell the same type of furniture.
The price of the furniture from Pooles of London is £1480
The price of the furniture from Jardins of Paris is €1980
The price of the furniture from Outways of New York is $2250

The exchange rates are
£1 = €1.34
£1 = $1.52

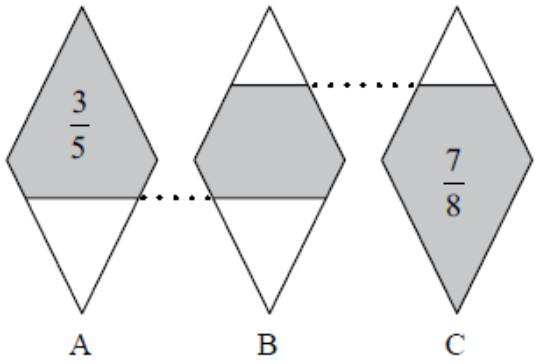
Which company sells this furniture at the lowest price?
You must show your working.

Problem Solving:

The diagram shows three identical shapes A, B and C.

$\frac{3}{5}$ of shape A is shaded.

$\frac{7}{8}$ of shape C is shaded.



What fraction of shape B is shaded?

Crossover Maths Starter

Quick 10

1) 35% of £280
2) Solve $3(2x + 3) = 27$
3) $1\frac{2}{3} + \frac{2}{5}$
4) Simplify $x^3 \times x^5$
5) Share \$45 in the ratio 2:7
6) $2 + 3^2 \times 4 - 5$
7) $\frac{2}{5}$ of 35
8) Make x the subject: $y = 3x + 5$
9) 4.56×2.1
10) $2(3x + 5) - 3(x - 2)$

How do you?...

Calculate compound interest?

Functional:

Aleena is planning a trip for people at her Youth Club.

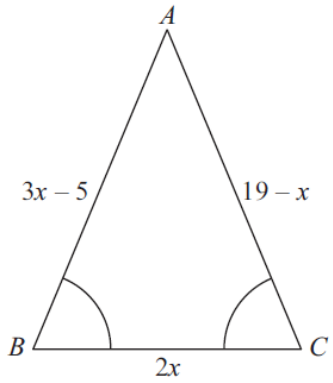
Here are the costs for the trip.

Transport	£230
Insurance	£50
Other costs	£30
Entry fee	£14 per person

Aleena charges £18 per ticket for the trip.
She sells 100 tickets.

Is there enough money from the ticket sales for Aleena to pay all the costs for the trip?
You must show your working.

Problem Solving:



Work out the perimeter of the triangle.
Give your answer as a number of centimetres.

Angle ABC = angle BCA.

Crossover Maths Starter

Quick 10

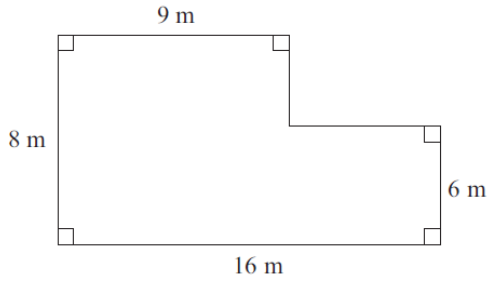
1) 45% of £180
2) Solve $5(4x + 3) = 55$
3) $2\frac{2}{3} - 1\frac{2}{5}$
4) Simplify $x^8 \div x^3$
5) Share \$81 in the ratio 4:5
6) $5 + 4^2 \times 2 - 10$
7) $\frac{3}{7}$ of 56
8) Make x the subject: $y = 2x - 9$
9) 67.6×3.5
10) $5(2x + 1) - 2(2x - 7)$

How do you?...

Find exterior and interior angles in regular polygons?

Functional:

The diagram shows the floor of a village hall.



The caretaker needs to polish the floor.

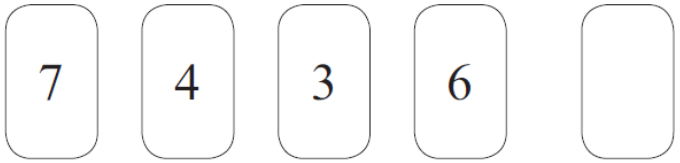
One tin of polish normally costs £19
One tin of polish covers 12 m² of floor.

There is a discount of 30% off the cost of the polish.

The caretaker has £130

Has the caretaker got enough money to buy the polish for the floor?
You must show all your working.

Problem Solving:



There is a different whole number from 0 to 9 on each card.
The number on the last card is hidden.

The median of the numbers on the five cards is 4

Which whole numbers could be on the last card?