

Calculate the answer to $7 - 3 \times 4$

a

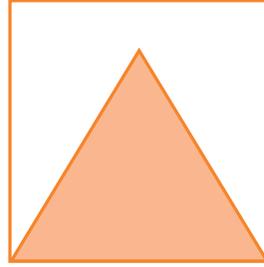
Solve the equation $4x = 10$

b

When picking a counter at random from a bag of counters, the probability of choosing a red counter is 0.7. There are more than 20 counters in the bag.

c

How many counters could there be?



Here is a square.

d

Inside the square is an equilateral triangle.

The triangle has a perimeter of 48mm.

Calculate the area of the square.

It takes 6 men 9 hours to paint a wall.

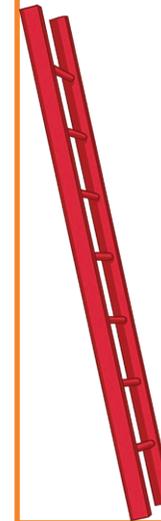
e

How long does it take 15 men to paint the wall? Give your answer in hours and minutes.

An 18m ladder is leaning against a vertical wall. It reaches a height of 12 metres.

f

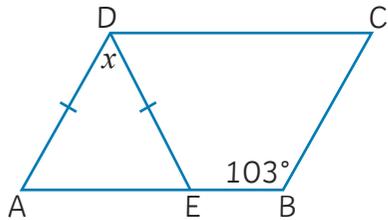
What angle does the ladder make with the ground? Give your answer correct to 1 decimal place.





ABCD is a parallelogram.

Find the missing angle, marked x , giving reasons for your answer.



Change 30cm^2 into m^2 .

Work out the missing values in these number sentences.

a. $\frac{3}{7}$ of 35 = 2 \times

b. $\frac{5}{8}$ of 56 = $\frac{2}{3}$ of

Fill in the gaps in this table. Leave all your answers in expanded form.

x		$x + 1$	$3x - 4$
3	12		
$2x$			$6x^2 - 8x$
		$x^2 + 3x + 2$	

Over their first four games, the mean number of goals a football team scores is 3. After the fifth game, the mean rises to 4.

How many goals did they score in the fifth game?

34 people were asked whether they liked tea, coffee or both.

The number of people who liked coffee was double the number of people who liked tea.

The number of people who liked neither tea nor coffee was a quarter of the number of people who liked coffee.

8 people said they liked both.

Draw a Venn diagram representing this information and work out the probability someone chosen at random likes only tea.





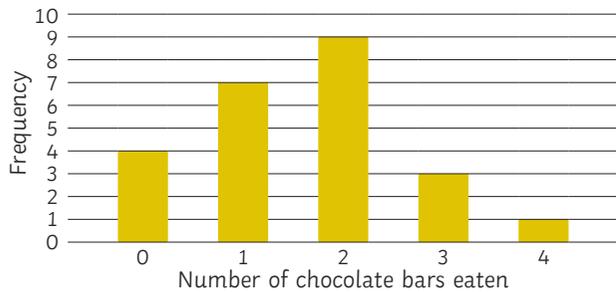
Find the n th term of the linear sequence,

5, 11, 17, 23, 29, ...

Estimate the answer to $\frac{113 \times 4.7}{0.49}$

The bar chart shows the number of chocolate bars eaten by a group of teenagers in a week.

Work out the total number of chocolate bars eaten.



Two numbers have a product of 36 and a difference of 9.

Work out the two numbers.

Tim is going to bake a cake. He needs to mix flour, sugar and baking powder in the ratio 9:5:1 by mass. He will need 900g of the mixture.

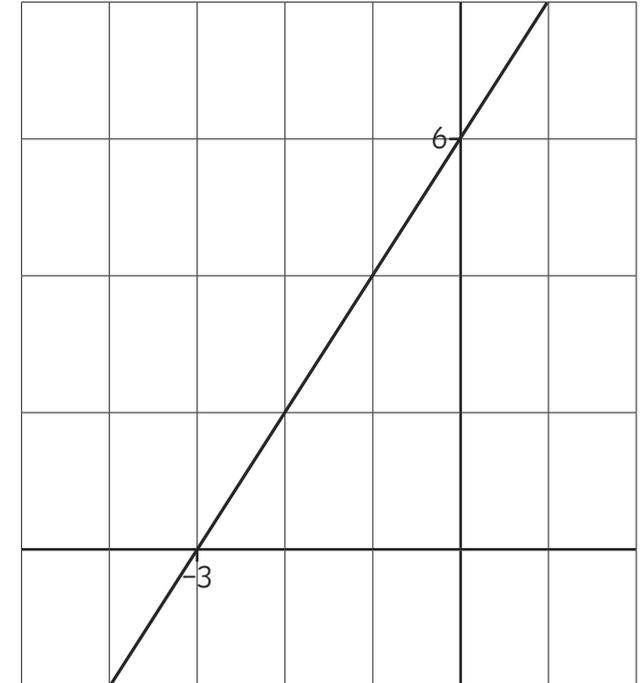
He has 600g flour, 350g sugar and 50g baking powder.

Does he have enough of each ingredient to make 900g of the mixture? Show your working.



The diagram shows a straight-line graph.

Work out the equation of the line.





a

Work out the following, leaving your answers in their simplest form.

a. $\frac{3}{5} \times \frac{2}{7}$

b. $1\frac{1}{2} \div \frac{3}{4}$

c. $2\frac{2}{3} - 1\frac{3}{5}$

b

Find the mean of the following set of numbers: 3, 7, 15, 2, 3

c

Alex says that $3.25 \times 0.177 = 5.7525$

Is he right? Explain your answer.

d

Prove that the two triangles are congruent.

e

The diagram shows a right-angled triangle.

Find the perimeter of the triangle.

Diagram NOT drawn to scale

f

The function machines show the cost in pounds, C , of renting a carpet cleaner for d days using 2 different rental options.

$d \rightarrow$

$\times 12$

 \rightarrow

$+ 40$

 $\rightarrow C$

$d \rightarrow$

$\times 10$

 \rightarrow

$+ 48$

 $\rightarrow C$

For what number of days is the cost the same for each rental option?

a

The prices of clothes in a shop are discounted by 15%. A jacket now costs £76.50.

How much did the jacket cost before the sale?

b

Use a ruler and compass to accurately construct a triangle with sides of length 4cm, 5cm and 7cm.

c

Use the laws of indices to show that any number raised to the power of zero is 1.

d

Explain why 4.1×10^5 is larger than 7.33×10^4 .

f

Ben wants to buy supplies for a barbecue.

Hot dogs come in packs of 6.
Each pack costs £1.80.



Hot dog rolls come in packs of 10.
Each pack costs £2.

Serviettes come in packs of 15.
Each pack costs £3.20.

He wants to buy the same number of hot dogs, hot dog rolls and serviettes but he must also ensure he has enough for his 50 guests.

How much will Ben need to spend?

e

Sally and Taj share £320. They want to share it so that Sally gets a quarter of the amount Taj gets.

How much do they each get?



a

$a = bc + d^2$

Calculate the value of a when $b = 4$, $c = 3$ and $d = -2$

c

Shade the area represented by the expression $ac + cd$.

e

Below is a scale drawing of a garden. The scale is 1cm to 2m.

AJ wants to plant some flowers. He wants the flowers to be less than 3m away from point A. The flowers must be closer to AD than AB.

Show the region where flowers can be placed.



b

The table shows information about the favourite colours of 18 friends.

Draw a pie chart representing this information.

Favourite Colour	Frequency
Red	7
Yellow	3
Blue	6
Green	2

d

Here is a rule for generating a sequence: "Multiply the previous term by 2 then subtract 3."

The second term of the sequence is 7.

Find the difference between the first and the fifth terms of the sequence.

f

A car travels from A to B to C without stopping.

The car travels at an average speed of 40mph between A and B, then at an average speed of 70mph between B and C.

Calculate the overall average speed from A to C, giving your answer correct to the nearest whole number.



a

Calculate the answer to $7 - 3 \times 4$

-5

b

Solve the equation $4x = 10$

$x = 2.5$ or $\frac{5}{2}$

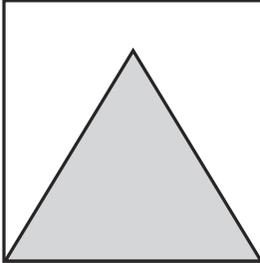
c

When picking a counter at random from a bag of counters, the probability of choosing a red counter is 0.7. There are more than 20 counters in the bag.

How many counters could there be?

The total number of counters must be a multiple of 10 that is larger than 20. You could have 30, 40, 50 counters (or so on).

d



Here is a square.
Inside the square is an equilateral triangle.
The triangle has a perimeter of 48mm.

Calculate the area of the square.

$48 \div 3 = 16$

One side of the square is 16mm, therefore the area is $16 \times 16 = 256$

256mm²

e

It takes 6 men 9 hours to paint a wall.

How long does it take 15 men to paint the wall? Give your answer in hours and minutes.

$9 \times 6 = 54$ hours for 1 man

$54 \div 15 = 3.6$ hours

3 hours 36 minutes

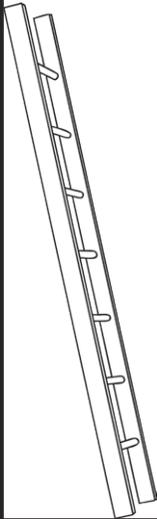
f

An 18m ladder is leaning against a vertical wall. It reaches a height of 12 metres.

What angle does the ladder make with the ground? Give your answer correct to 1 decimal place.

$x = \sin^{-1}\left(\frac{12}{18}\right)$

$x = 41.8^\circ$ (to 1d.p.)

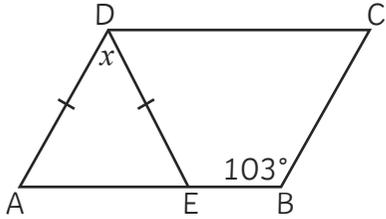


41.8°



ABCD is a parallelogram.

Find the missing angle, marked x , giving reasons for your answer.



Angle $DAB = 77^\circ$, supplementary angles add up to 180° .

Angle $AED = 77^\circ$, two angles in an isosceles triangle are equal.

$$180 - (77 + 77) = 26^\circ$$

Therefore $x = 26^\circ$, angles in a triangle add to 180° .

26°

Change 30cm^2 into m^2 .

$$30 \div 100^2$$

0.003m²

Work out the missing values in these number sentences.

a. $\frac{3}{7}$ of 35 = 2 × 7.5 a. $35 \div 7 = 5$
 $5 \times 3 = 15$
 $\frac{1}{2}$ of 15 = 7.5

b. $\frac{5}{8}$ of 56 = $\frac{2}{3}$ of 52.5 b. $56 \div 8 = 7$
 $7 \times 5 = 35$
 $35 \times 3 = 105$
 $105 \div 2 = 52.5$

Fill in the gaps in this table. Leave all your answers in expanded form.

x	4	$x + 1$	$3x - 4$
3	12	$3x + 3$	$9x - 12$
$2x$	$8x$	$2x^2 + 2x$	$6x^2 - 8x$
$x + 2$	$4x + 8$	$x^2 + 3x + 2$	$3x^2 + 2x - 8$

Over their first four games, the mean number of goals a football team scores is 3. After the fifth game, the mean rises to 4.

How many goals did they score in the fifth game?

$$4 \times 3 = 12$$

$$5 \times 4 = 20$$

$$20 - 12 = 8$$

8 goals

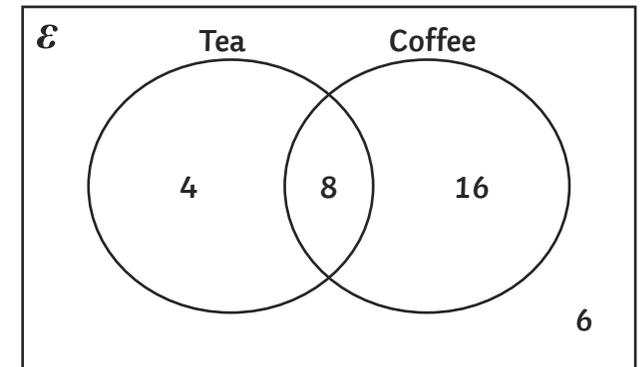
34 people were asked whether they liked tea, coffee or both.

The number of people who liked coffee was double the number of people who liked tea.

The number of people who liked neither tea nor coffee was a quarter of the number of people who liked coffee.

8 people said they liked both.

Draw a Venn diagram representing this information and work out the probability someone chosen at random likes only tea.



$\frac{4}{34}$ or $\frac{2}{17}$



a

Find the nth term of the linear sequence,
5, 11, 17, 23, 29, ...

$6n - 1$

b

Estimate the answer to $\frac{113 \times 4.7}{0.49}$

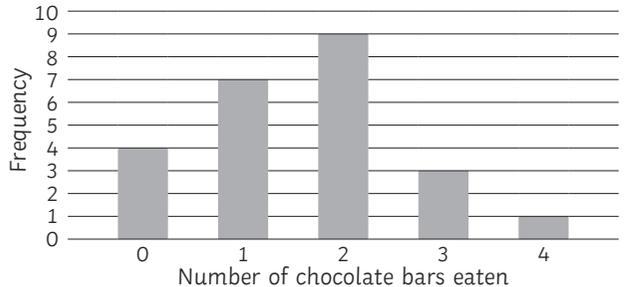
$$\frac{100 \times 5}{0.5}$$

1000

c

The bar chart shows the number of chocolate bars eaten by a group of teenagers in a week.

Work out the total number of chocolate bars eaten.



Number of chocolate bars eaten	Frequency
0	4
1	7
2	9
3	3
4	1

$7 + 18 + 9 + 4$

38 bars

d

Two numbers have a product of 36 and a difference of 9.

Work out the two numbers.

3 and 12

e

Tim is going to bake a cake. He needs to mix flour, sugar and baking powder in the ratio 9:5:1 by mass. He will need 900g of the mixture.

He has 600g flour, 350g sugar and 50g baking powder.

Does he have enough of each ingredient to make 900g of the mixture? Show your working.

$900 \div 15 = 60$
 $60 \times 9 = 540\text{g flour}$
 $60 \times 5 = 300\text{g sugar}$
 $60 \times 1 = 60\text{g baking powder}$

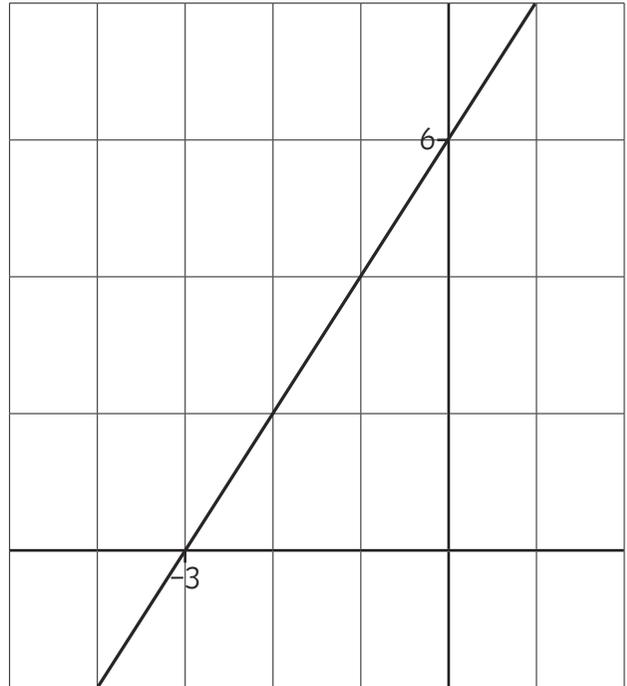
No, he does not have enough baking powder.



f

The diagram shows a straight-line graph.

Work out the equation of the line.



$y = 2x + 6$



a

Work out the following, leaving your answers in their simplest form.

a. $\frac{3}{5} \times \frac{2}{7}$

b. $1\frac{1}{2} \div \frac{3}{4}$

c. $2\frac{2}{3} - 1\frac{3}{5}$

a. $\frac{6}{35}$

b. $\frac{3}{2} \times \frac{4}{3} = 2$

c. $\frac{8}{3} - \frac{8}{5} = \frac{40}{15} - \frac{24}{15} = \frac{16}{15} = 1\frac{1}{15}$

b

Find the mean of the following set of numbers: 3, 7, 15, 2, 3

$30 \div 5$ 6

c

Alex says that $3.25 \times 0.177 = 5.7525$

Is he right? Explain your answer.

No, he is wrong.

We can estimate by rounding the numbers to 1 significant figure. This gives $3 \times 0.2 = 0.6$

His answer is far too big.

d

Prove that the two triangles are congruent.

Angle BAC = angle DEF

AC = DE

AB = EF

We have SAS, therefore the triangles are congruent.

e

The diagram shows a right-angled triangle.

Find the perimeter of the triangle.

Diagram NOT drawn to scale

Using Pythagoras' theorem, or Pythagorean triples, the missing length is 8cm.

The perimeter is therefore $10 + 8 + 6 = 24$

24cm

f

The function machines show the cost in pounds, C, of renting a carpet cleaner for d days using 2 different rental options.

$d \rightarrow$ × 12 \rightarrow + 40 $\rightarrow C$

$d \rightarrow$ × 10 \rightarrow + 48 $\rightarrow C$

For what number of days is the cost the same for each rental option?

Solving simultaneously gives a value of $d = 4$. On day 4 both options cost £88.



a

The prices of clothes in a shop are discounted by 15%. A jacket now costs £76.50.

How much did the jacket cost before the sale?

$76.50 \div 0.85 = 90$

£90

b

Use a ruler and compass to accurately construct a triangle with sides of length 4cm, 5cm and 7cm.

Correctly drawn triangle with arcs seen.

c

Use the laws of indices to show that any number raised to the power of zero is 1.

For example:

$x^n \div x^n = x^0$ since we subtract the powers when dividing.

We also know that if we divide a number by itself we get 1.

This means that $x^0 = 1$.

d

Explain why 4.1×10^5 is larger than 7.33×10^4 .

$4.1 \times 10^5 = 410\ 000$

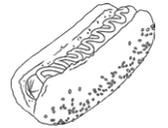
$7.33 \times 10^4 = 73\ 300$

Therefore 4.1×10^5 is larger than 7.33×10^4 .

f

Ben wants to buy supplies for a barbecue.

Hot dogs come in packs of 6.
Each pack costs £1.80.



Hot dog rolls come in packs of 10.
Each pack costs £2.

Serviettes come in packs of 15.
Each pack costs £3.20.

He wants to buy the same number of hot dogs, hot dog rolls and serviettes but he must also ensure he has enough for his 50 guests.

How much will Ben need to spend?

The lowest common multiple of 6, 10 and 15 is 30. He must therefore buy 60 of each.

This will cost

$£18 + £12 + £12.80$

£42.80

e

Sally and Taj share £320. They want to share it so that Sally gets a quarter of the amount Taj gets.

How much do they each get?

$320 \div 5 = 64$

Sally gets £64 and Taj gets £256.

a

$a = bc + d^2$

Calculate the value of a when $b = 4$, $c = 3$ and $d = -2$

$a = 12 + 4$

16

c

Shade the area represented by the expression $ac + cd$.

Or opposite side

e

Below is a scale drawing of a garden. The scale is 1cm to 2m.

AJ wants to plant some flowers. He wants the flowers to be less than 3m away from point A. The flowers must be closer to AD than AB.

Show the region where flowers can be placed.

b

The table shows information about the favourite colours of 18 friends.

Draw a pie chart representing this information.

Favourite Colour	Frequency	Degrees
Red	7	140
Yellow	3	60
Blue	6	120
Green	2	40

d

Here is a rule for generating a sequence: "Multiply the previous term by 2 then subtract 3."

The second term of the sequence is 7.

Find the difference between the first and the fifth terms of the sequence.

The first term is 5. The fifth term is 35.

30

Accurate and fully-labelled pie chart with the above angles.

f

A car travels from A to B to C without stopping.

The car travels at an average speed of 40mph between A and B, then at an average speed of 70mph between B and C.

Calculate the overall average speed from A to C, giving your answer correct to the nearest whole number.

A — 15 miles — B — 28 miles — C

Time taken from A to B = $15 \div 40 = 0.375$ hours or 22 minutes 30 seconds.

Time taken from B to C = $28 \div 70 = 0.4$ hours or 24 minutes.

Total time taken = 0.775 hours

Average speed = $\frac{43}{0.775} = 55$ (to the nearest whole number)

55mph

