

Bearings

Video 26 on Corbettmaths

Question 5: Give these directions of travel as three figure bearings

- | | | | |
|-----------|----------------|-----------|----------------|
| (a) North | (b) South-east | (c) West | (d) North-east |
| (e) East | (f) South-west | (g) South | (h) North-west |

Question 6: A dolphin is on a bearing of 100° from the island.
 The same dolphin is on a bearing of 015° from the lighthouse.
 On a sketch of the diagram below, mark the location of the dolphin.



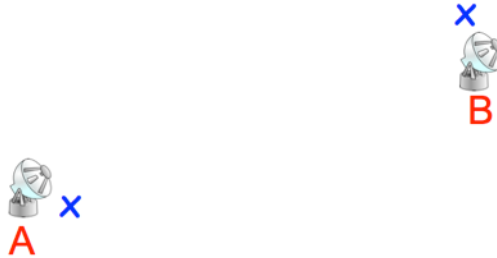
Question 7: A hot-air balloon is on a bearing of 140° from the radar A.
 The same hot-air balloon is on a bearing of 065° from the radar B.
 On a sketch of the diagram below, mark the location of the hot-air balloon.



Bearings

Video 26 on Corbettmaths

Question 8: A UFO is on a bearing of 015° from the radar A.
The same UFO is on a bearing of 315° from the radar B.
On a sketch of the diagram below, mark the location of the UFO.



Question 9:

- The bearing of A from B is 025° , find the bearing of B from A.
- The bearing of A from B is 061° , find the bearing of B from A.
- The bearing of A from B is 098° , find the bearing of B from A.
- The bearing of A from B is 102° , find the bearing of B from A.
- The bearing of A from B is 193° , find the bearing of B from A.
- The bearing of A from B is 222° , find the bearing of B from A.
- The bearing of A from B is 315° , find the bearing of B from A.

Question 10: Make a copy of the diagram below into your book.



- Find the bearing of B from A.
- Find the bearing of A from B.

Use the scale 1cm represents 20miles.

- From your diagram, work out the real distance between A and B.

C is 140 miles from B on a bearing of 110° .

- On your diagram, mark C with a cross.



Capture Recapture
Video 391 on www.corbettmaths.com

Examples



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Workout

Question 1: Hannah wants to estimate the number of eels in a lake.

She catches and rings 50 eels.

She returns the 50 eels to the lake.

The next day Hannah catches 400 eels.

Of these 400 eels, 10 are ringed.



Work out an estimate for the total number of eels in the lake.

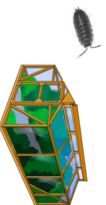
Question 2: Tom wants to estimate the number of woodlice in a greenhouse.

He catches and marks 32 woodlice.

The woodlice are then returned to the greenhouse.

The next day Tom catches 20 woodlice.

8 of these are marked.



Work out an estimate for the total number of woodlice in the greenhouse.

Question 3: A scientist wants to estimate the total number of fish in a pond.

On Thursday, she catches 180 fish.

These fish are marked and returned to the pond.

On Friday, the scientist catches 305 fish.

45 of these fish are marked.



(a) Work out an estimate for the total number of fish in the pond

(b) What assumptions have you made?

Question 4: Darren wants to estimate how many grasshoppers live in a field.

He catches and marks 24 grasshoppers.

He then releases the grasshoppers.

The next day, Darren returns to the same field and captures 51 grasshoppers.

7 of these have been marked.



Work out an estimate for the total number of grasshoppers in the field.



Capture Recapture
Video 391 on www.corbettmaths.com

Question 5: Heather has a large jar of jelly beans.

Heather wants to find an estimate for the total number of jelly beans in the jar.

She takes out all the jelly beans and marks 200 of them.

Heather mixes the jelly beans and puts them back into the jar.

Heather then takes 140 jelly beans from the jar.

3 of the jelly beans are marked.

Heather then puts all the jelly beans back into the jar.



(a) Work out an estimate for the number of jelly beans in the jar.

(b) What assumptions have you made?

Apply

Question 1: Charlotte wants to work out an estimate of the number of fish living in a pond.

She captures X fish and tags them.

Charlotte returns the fish to the pond.

The next day Charlotte catches 50 fish.

Of these 50 fish, 32 are tagged.

Charlotte's estimate of the number of fish in the pond is 125.

Work out how many fish Charlotte tagged, X.

Question 2: Ronan wants to estimate the number of honey bees in a beehive.

On Wednesday, Ronan catches 660 honey bees from the beehive.

He marks the honey bees and then releases them.

On Thursday, Ronan catches 400 honey bees and notes how many were marked.

Ronan then calculates his estimate as 22,000 honey bees in the beehive.

How many of the 400 honey bees caught on Thursday were marked?



Question 3: Rhys has a large tub of yellow counters.
Alex has a large tub of blue counters.

40 yellow counters are taken from Rhys' tub and placed into Alex's tub.
40 blue counters are taken from Alex's tub and placed into Rhys' tub.

Rhys randomly selects 100 counters from his tub.
8 of the 100 counters are blue.

Alex randomly selects 50 counters from his tub.
48 of the 50 counters are blue.

All the counters are then placed into one tub.

Work out an estimate for the ratio of yellow to blue counters in the tub.

Question 4: A scientist wants to estimate the number of lions living in a region.

On Thursday, he locates and tags some lions.

On Friday he returns and locates 10 less lions than he had on Thursday.
He notices that 4 of the lions are tagged.

The scientist works out an estimate for the total number of lions living in the region.

He notices that the number of lions that he had caught on Thursday, was a fifth of the total number of lions.

How many lions live in the region?



Answers

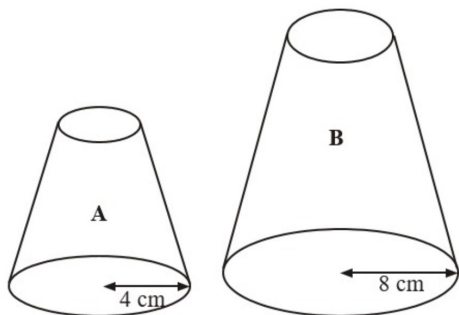


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1.



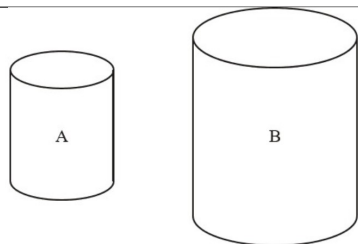
Two solid shapes, A and B, are mathematically similar.
 The base of shape A is a circle with radius 4 cm.
 The base of shape B is a circle with radius 8 cm.
 The surface area of shape A is 80 cm^2

(a) Work out the surface area of shape B. (2 marks)

The volume of shape B is 600 cm^3 .

(b) Work out the volume of shape A. (2 marks)

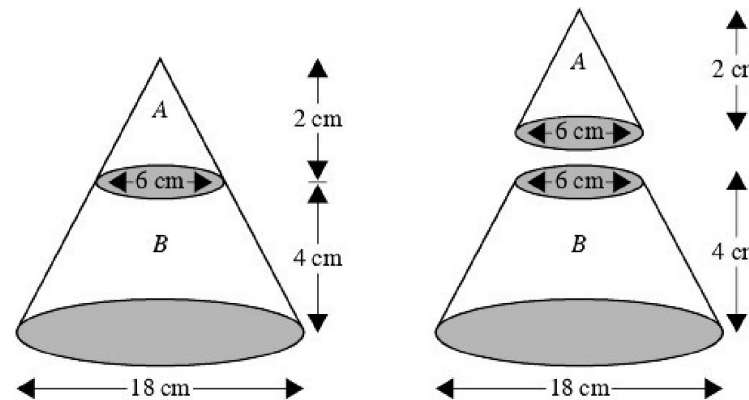
2.



The two cylinders, A and B, are mathematically similar.
 The height of cylinder B is twice the height of cylinder A.
 The total surface area of cylinder A is 180 cm^2 .

Calculate the total surface area of cylinder B. (3 marks)

3.

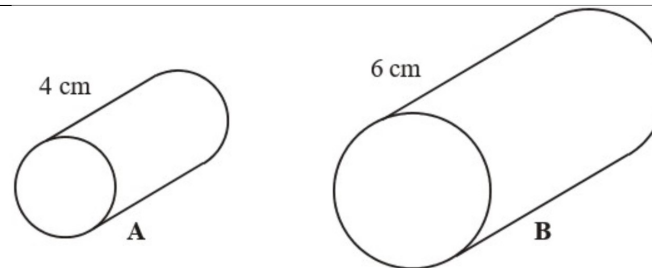


The diagram represents a large cone of height 6 cm and base diameter 18 cm.

The large cone is made by placing a small cone A of height 2 cm and base diameter 6 cm on top of a frustum B.

Calculate the volume of the frustum B.
 Give your answer in terms of π . (4 marks)

4.



Cylinder A and cylinder B are mathematically similar.

The length of cylinder A is 4 cm and the length of cylinder B is 6 cm.

The volume of cylinder A is 80 cm^3 .

Calculate the volume of cylinder B. (3 marks)

5. X and Y are two geometrically similar solid shapes.

The total surface area of shape X is 450 cm^2 .

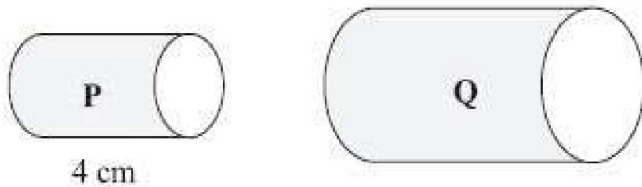
The total surface area of shape Y is 800 cm^2 .

The volume of shape X is 1350 cm^3 .

Calculate the volume of shape Y.

(3 marks)

6.



Two cylinders, P and Q, are mathematically similar.

The total surface area of cylinder P is $90\pi \text{ cm}^2$.

The total surface area of cylinder Q is $810\pi \text{ cm}^2$.

The length of cylinder P is 4 cm.

(a) Work out the length of cylinder Q.

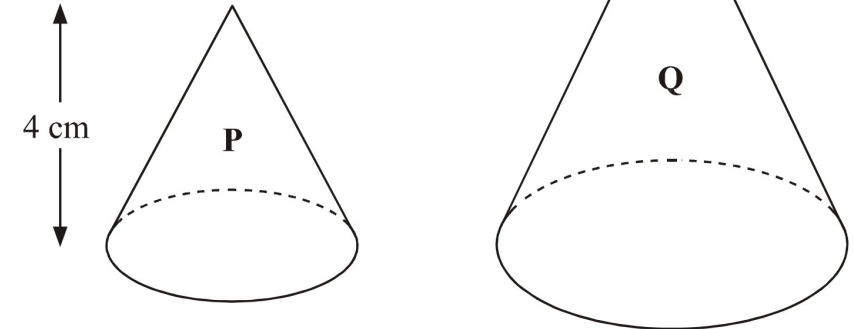
(3 marks)

The volume of cylinder P is $100\pi \text{ cm}^3$.

(b) Work out the volume of cylinder Q.
Give your answer as a multiple of π .

(2 marks)

7.



Two cones, P and Q, are mathematically similar.

The total surface area of cone P is 24 cm^2 .

The total surface area of cone Q is 96 cm^2 .

The height of cone P is 4 cm.

(a) Work out the height of cone Q.

(3 marks)

The volume of cone P is $12\pi \text{ cm}^3$.

(b) Work out the volume of cone Q.

(2 marks)

Question 5: Sketch the following graphs.

(a) $y = x^2 + 6x + 8$

(b) $y = x^2 - x - 6$

(c) $y = x^2 + 6x + 9$

(d) $y = x^2 - 13x + 42$

(e) $y = x^2 + 5x - 36$

(f) $y = x^2 - 2x + 1$

(g) $y = x^2 + 5x + 11$

(h) $y = x^2 - 4x + 7$

Question 6: Sketch the following graphs.

(a) $y = (x - 7)(x + 10)$

(b) $y = (x + 3)(x + 8)$

(c) $y = (x - 2)^2$

Question 7: Sketch the following graphs.

(a) $y = x^2 - 49$

(b) $y = x^2 - 1$

(c) $y = x^2 - 196$

Question 8: Michael wants to sketch the graph of $y = -x^2 + 5x + 14$

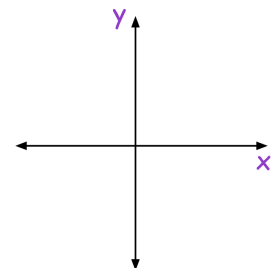
(a) Find the value of y when $x = 0$

(b) Use your answer to (a) to plot where the graph crosses the y -axis.

(c) Solve the equation $-x^2 + 5x + 14 = 0$

(d) Use your answers to (c) to help you plot where the graph crosses the x -axis.

(e) Sketch the graph of $y = -x^2 + 5x + 14$



Question 9: Sketch the following graphs.

(a) $y = -x^2 - 5x - 4$

(b) $y = -x^2 + 9x - 18$

(c) $y = 84 - 5x - x^2$

(d) $y = (3 - x)(x + 8)$

(e) $y = -x^2 - 8x - 16$

(f) $y = 144 - x^2$

Question 10: Robyn wants to sketch the graph of $y = 2x^2 + 9x + 4$

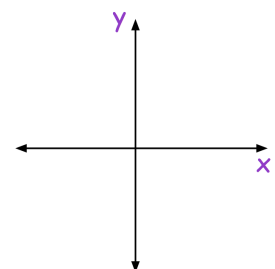
(a) Find the value of y when $x = 0$

(b) Use your answer to (a) to plot where the graph crosses the y -axis.

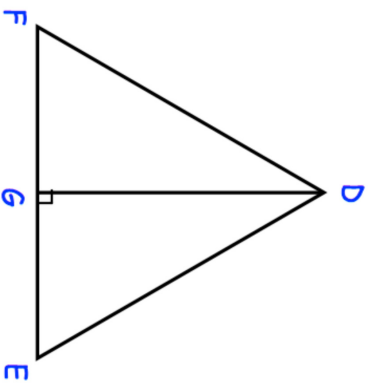
(c) Solve the equation $2x^2 + 9x + 4 = 0$

(d) Use your answers to (c) to help you plot where the graph crosses the x -axis.

(e) Sketch the graph of $y = 2x^2 + 9x + 4$



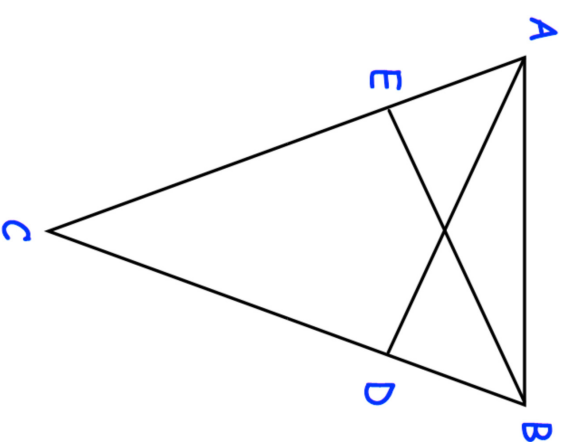
9. DEF is an equilateral triangle.



- G lies on EF.
DG is perpendicular to FE.
Prove $\triangle DFG$ is congruent to $\triangle DEG$.

(3)

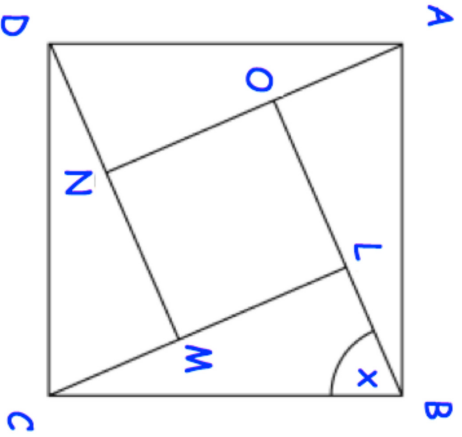
10. ABC is an isosceles triangle in which $AC = BC$.
D and E are points on BC and AC such that $CE = CD$.



- Prove triangles ACD and BCE are congruent.

(4)

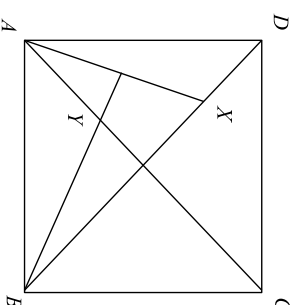
11. ABCD and LMNO are squares.
Angle CBL = x



Prove that triangles ABO and CBL are congruent.

(4)

12. ABCD is a square, X is a point in the diagonal BD and the perpendicular from B to AX meets AC in Y.

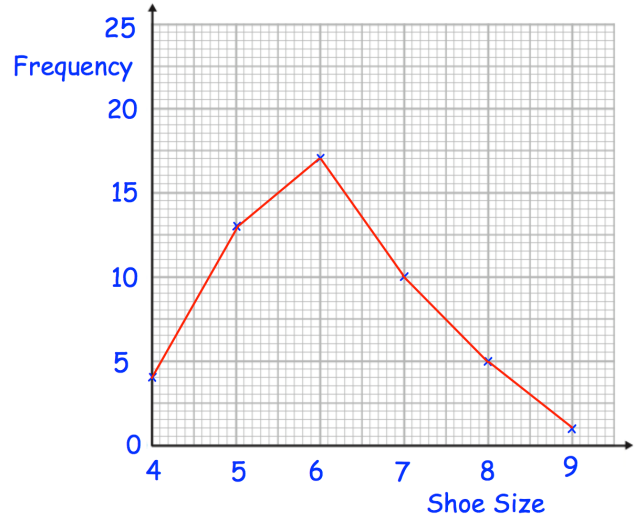


Prove that triangles AXD and AYB are congruent.

(4)

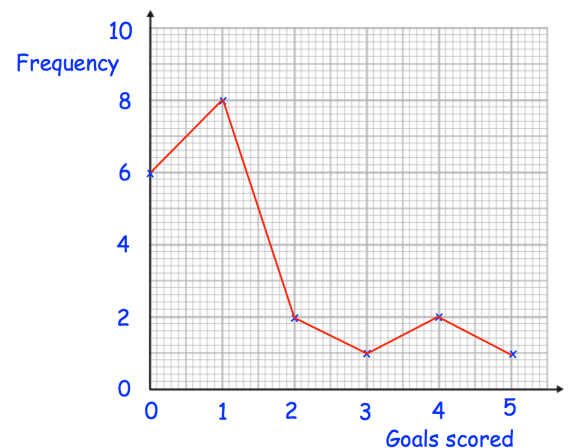
Question 2: Henry surveyed 50 people.
This frequency polygon shows their shoe sizes.

- What is the modal shoe size?
- What is the range of the shoe sizes?
- What fraction of the people surveyed have size 5 shoes?
- What percentage of the people surveyed have size 7 shoes?
- Henry picks somebody at random to win a prize.
Write down the probability that the winner has size 6 shoes.



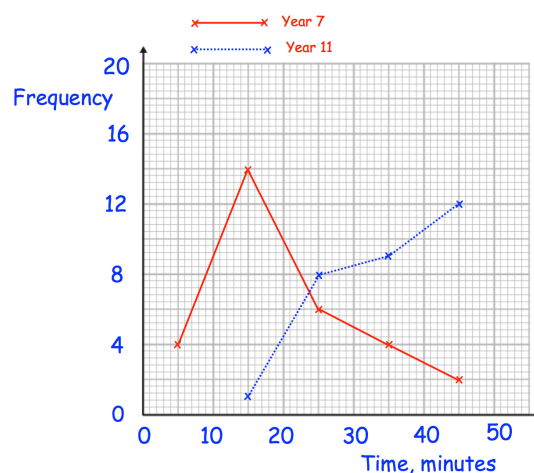
Question 3: Roy is a striker for Rovers.
The frequency polygon shows the number of goals scored in each game over 20 games he has played.

- Work out the median number of goals scored per game.
- Work out the mean number of goals scored per game.
- A journalist asks him for the “average” number of goals scored per game.
Which average should he use?



Question 4: The frequency polygons show the amount of time that 30 students in year 7 and 30 students in year 11 spent on their last maths homework.

Compare the time spent on homework by the year 7s and the year 11s.



Frequency Polygons

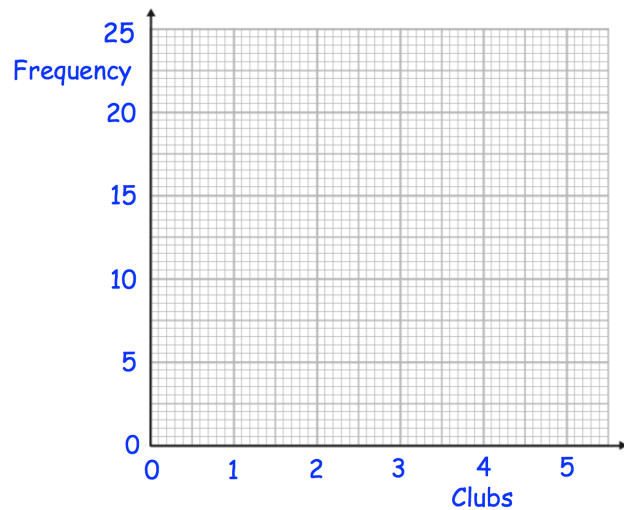
Videos 155 and 156 on www.corbettmaths.com

Question 5: 50 boys and 50 girls attend a primary school.
The table below shows how many clubs they attend.

(a) On the same grid, draw a frequency polygon for the boys and a frequency polygon for the girls.

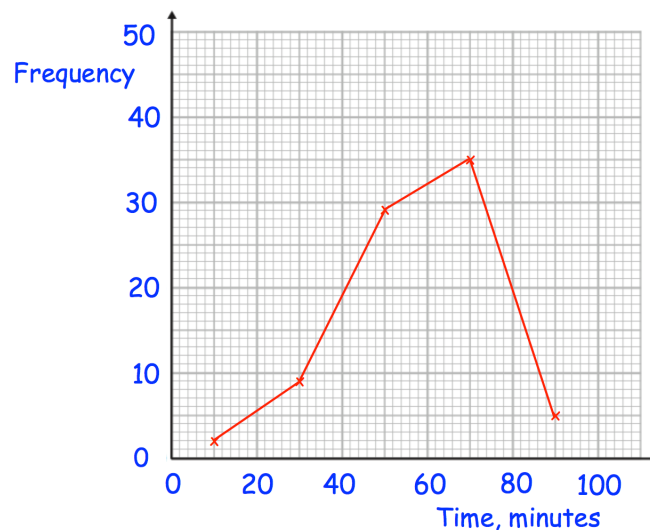
(b) Compare the distributions.

Clubs	Boys	Girls
0	5	2
1	20	18
2	14	22
3	9	7
4	2	1



Question 6: The frequency polygon shows information about the amount of time people spend in the gym.

Calculate an estimate of the mean time spent in the gym.



Answers



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Apply

Question 1: Paul has a deck of 50 cards, each with a shape on it.
The shapes are either red or black.

	Square	Rectangle	Kite
Red	17	6	1
Black	4	9	13

Paul picks a card at random.

- (a) What is the probability that the card has a black kite on it?
- (b) What is the probability that the card has a red shape on it?
- (c) What is the probability that the card has a square on it?
- (d) What is the probability that the card has a shape with at least 2 lines of symmetry?

Question 2: 60 people visited a swimming pool one evening.
13 out of the 19 people who wore goggles were adults.
There were 15 children.

- (a) Complete a two-way table for this information.
- (b) How many adults did not wear goggles?
- (c) What fraction of the children wore goggles?

Question 3: 100 families booked a holiday in July or in August, at a travel agents.
Some of the families booked to go to France.
Some booked to go to Spain.
The rest of the families booked a holiday to Portugal.

59 families booked to go on holiday in August.
19 of the 35 families going to France booked to go in July.
30 families booked to go to Portugal.
20 families booked to go to Spain in August.

- (a) Create a two-way table for this information.
- (b) How many families booked to go to Portugal in July?

Question 4: There are 120 students in Year 11 at a school.
Each student studies one language, either French, Spanish, German or Welsh.
21 of the 40 students studying Welsh are male.
18 males and 9 females study French.
12 of the 17 students studying Spanish are female.
Twice as many females study German than males.

How many students in Year 11 are female?

Two Way Tables

Video 319 on www.corbettmaths.com

Question 5: A teacher surveys 64 children on how they travelled to school.
 20 of the students were in Year 7.
 The teacher surveyed 30% more students in Year 9 than in Year 7.
 The rest of the students surveyed were in Year 11.
 75% of the students in Year 7 walked to school.
 8 more students in Year 9 walked to school than did not walk.
 Out of students surveyed, more Year 11 students walked to school than Year 9 students.

One of these students is picked at random

Write down the probability that the student chosen will walk to school.

Question 6: Isla has a box of counters.
 The table shows information about the shape and colours of the counters.

		Shape		
		Circle	Triangle	Square
Colour	Blue	6	2	5
	Red	8	9	11

Isla picks a counter at random, looked at it and then returned it to the box.

(a) Given it is a circular counter, what is the probability that it was red?

David picks a counter at random, looked at it and then returned it to the box.

(b) Given it is a blue counter, what is the probability that it was triangular?

Emily adds a number of red square counters to the box.

The probability of Emily picking a red square at random is now $\frac{2}{3}$

(c) How many red square counters did Emily add to the box?

Answers



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Box Plots

Videos 149 and 150 on www.corbettmaths.com

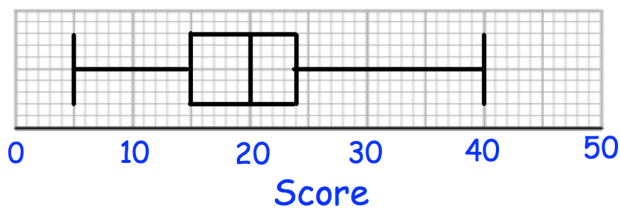
Question 4: Draw a box plot for each set of data

- (a) 8, 10, 13, 14, 14, 15, 15, 16, 18, 19, 21, 22, 24, 29, 35
- (b) 40, 80, 90, 90, 100, 120, 130
- (c) 5.9, 7.3, 7.8, 8, 8.4, 8.7, 8.9, 8.9, 8.9, 9, 9, 9.1, 9.1, 9.3, 9.5, 9.6, 9.9, 10.5, 10.9

Question 5: Compare the distributions of each pair of box plots below.

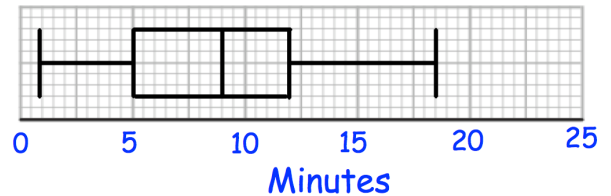
(a)

7A results

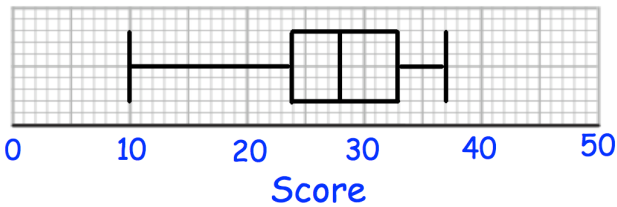


(b)

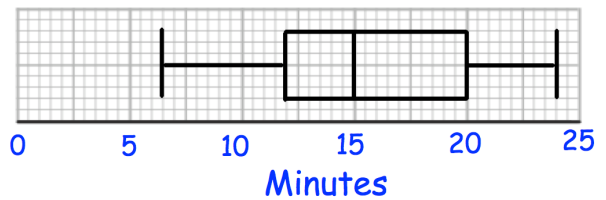
Time taken to complete puzzle - Children



7B results

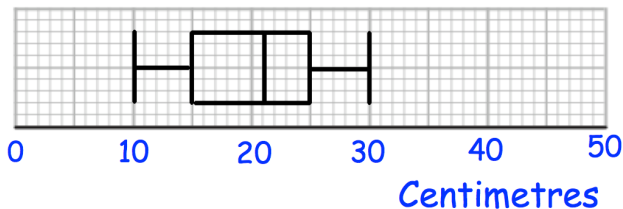


Time taken to complete puzzle - Adults



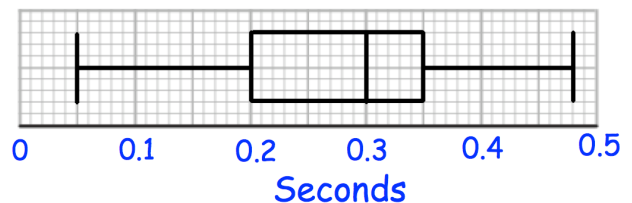
(c)

Length of red squirrels

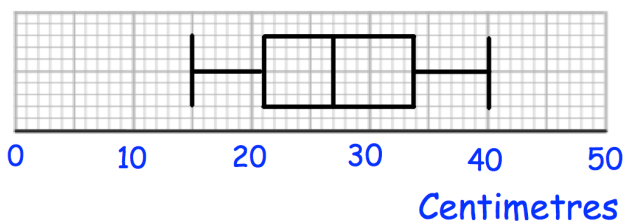


(d)

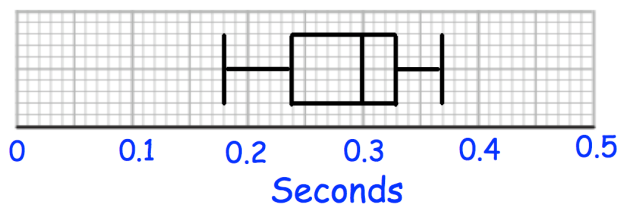
Reaction Times - Group A



Length of grey squirrels



Reaction Times - Group B



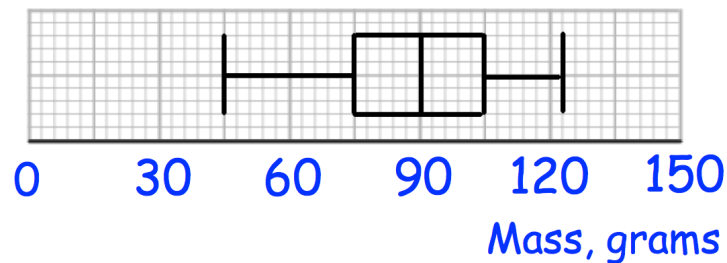
Box Plots

Videos 149 and 150 on www.corbettmaths.com

Question 3: Mr Jones is an estate agent on the Isle of Man. He has created this table to show information about the prices of houses he has sold. Explain how you know he has made a mistake.

Median	£375,000
Range	£235,000
Interquartile Range	£590,000

Question 4: The box plot show information about the masses of apples in a crate.



Jack is going to select apples at random from the crate. After selecting each apple, he records its mass and returns it to the crate before picking another. Work out the probability that:

- Jack picks two apples, both under 75g
- Jack picks two apples, both over 90g
- Jack picks two apples, both over 105g
- Jack picks two apples, one under 90g and one over 105g
- Jack picks three apples, all over 105g
- Jack picks three apples, two over 105g and one under 75g.

Answers



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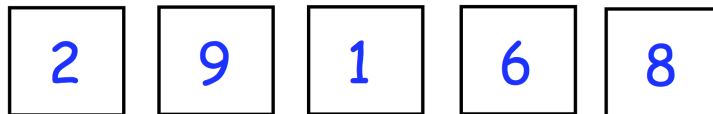


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Product Rule for Counting

Video 383 on www.corbettmaths.com

- Question 6: Oliver picks a 4-digit **even** number that is greater than 3000.
The second digit is a multiple of 4.
How many different numbers could Oliver pick?
- Question 7: Sophia is creating a 6-digit code to lock her iPad.
She only uses digits greater than 2.
She only uses each digit once.
How many possible codes can Sophia create?
- Question 8: In a class, there are 10 boys and 9 girls.
The teacher has been asked to pick one boy and one girl to win a prize.
How many possible pairs of students can the teacher pick?
- Question 9: Jason picks a 5-digit number that is less than 80000.
The first digit is odd.
The fourth and fifth digits are equal.
How many different numbers can Jason pick?
- Question 10: A headteacher wants to survey two Year 7 students.
There are 100 students in Year 7.
How many possible pairs of students can the headteacher pick?
- Question 11: How many even numbers greater than 40000 can be created using these digits?



Apply

- Question 1: On a school trip, students are given a packed lunch.
The students can choose one piece of fruit and one snack.
There are 8 different pieces of fruit and some different snacks.
Altogether there are 104 different ways to choose one piece of fruit and one snack
How many different snacks are there?

Product Rule for Counting

Video 383 on www.corbettmaths.com

Question 2: At a summer camp, children pick a morning, an afternoon and an evening activity.

There are 4 morning and 7 evening activities to pick from.

Altogether there are 224 different ways to choose their activities.

How many afternoon activities are there?

Question 3: In a gym there are

12 exercise classes on a Monday

13 exercise classes on a Wednesday

7 exercise classes on a Friday

Katie is going to attend either

a class on Monday and a class on Friday

or a class on Wednesday and a class on Friday

or a class on Monday, Wednesday and Friday

Work out how many different ways there are to pick which exercises classes Katie is going to attend.

Question 4: A group of 10 people enter a room.
Each person shakes hands, once, with all the other people in the room.

How many handshakes are there in total?



Question 5: A pizza parlour sells 9 different toppings.

Michael orders a pizza with 2 different toppings.

(a) How many different pizzas can he choose from?

Beth orders a pizza with 3 different toppings.

(b) How many different pizzas can she choose from?

John orders a pizza with 4 different toppings.

(c) How many different pizzas can he choose from?

Answers



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C1 COORDINATE GEOMETRY

Worksheet A

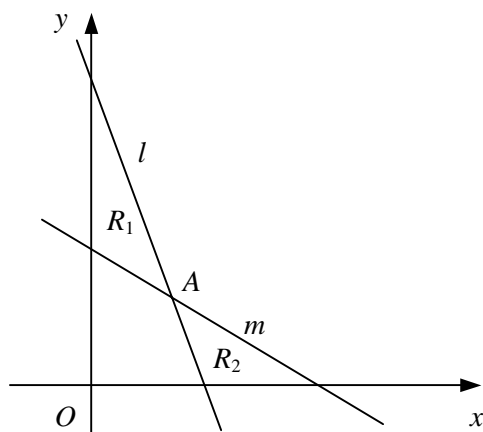
- Find the gradient of the line segment joining each pair of points.
 - (3, 1) and (5, 5)
 - (4, 7) and (10, 9)
 - (6, 1) and (2, 5)
 - (-2, 2) and (2, 8)
 - (1, 3) and (7, -1)
 - (4, 5) and (-5, -7)
 - (-2, 0) and (0, -8)
 - (8, 6) and (-7, -2)
- Write down the gradient and y-intercept of each line.
 - $y = 4x - 1$
 - $y = \frac{1}{3}x + 3$
 - $y = 6 - x$
 - $y = -2x - \frac{3}{5}$
- Find the gradient and y-intercept of each line.
 - $x + y + 3 = 0$
 - $x - 2y - 6 = 0$
 - $3x + 3y - 2 = 0$
 - $4x - 5y + 1 = 0$
- Write down, in the form $y - y_1 = m(x - x_1)$, the equation of the straight line with the given gradient which passes through the given point.
 - gradient 2, point (4, 1)
 - gradient 5, point (2, -5)
 - gradient -3, point (-1, 1)
 - gradient $\frac{1}{2}$, point (1, 6)
 - gradient -2, point $(\frac{3}{4}, -\frac{1}{4})$
 - gradient $-\frac{1}{5}$, point (-3, -7)
- Find, in the form $y = mx + c$, the equation of the straight line with the given gradient which passes through the given point.
 - gradient 3, point (1, 2)
 - gradient -1, point (5, 3)
 - gradient 4, point (-2, -3)
 - gradient -2, point (-4, 1)
 - gradient $\frac{1}{3}$, point (-3, 1)
 - gradient $-\frac{5}{6}$, point (9, -2)
- Find, in each case, the equation of the straight line with gradient m which passes through the point P . Give your answers in the form $ax + by + c = 0$, where a , b and c are integers.
 - $m = 1$, $P(2, -4)$
 - $m = \frac{1}{2}$, $P(6, 1)$
 - $m = -4$, $P(-1, 8)$
 - $m = \frac{2}{5}$, $P(-3, 5)$
 - $m = -3$, $P(\frac{3}{2}, -\frac{1}{8})$
 - $m = -\frac{3}{4}$, $P(\frac{2}{3}, -7)$
- Find, in the form $y = mx + c$, the equation of the straight line passing through each pair of points.
 - (0, 1) and (4, 13)
 - (2, 9) and (7, -1)
 - (-4, 3) and (2, 7)
 - $(-\frac{1}{2}, -2)$ and (2, 8)
 - (3, -2) and (18, -5)
 - (-3.2, 4) and (-2, 0.4)
- Find, in the form $ax + by + c = 0$, where a , b and c are integers, the equation of the straight line which passes through each pair of points.
 - (3, 0) and (5, 2)
 - (-1, 8) and (5, -4)
 - (-5, 3) and (7, 5)
 - (-4, -1) and (8, -17)
 - (2, -1.5) and (7, 0)
 - $(-\frac{3}{5}, \frac{1}{10})$ and (3, 1)
- The straight line l passes through the points $A(-6, 8)$ and $B(3, 2)$.
 - Find an equation of the line l .
 - Show that the point $C(9, -2)$ lies on l .
- The point $M(k, 2k)$ lies on the line with equation $x - 3y + 15 = 0$. Find the value of the constant k .

C1 COORDINATE GEOMETRY

Worksheet C

- 1 The straight line l has gradient -3 and passes through the point with coordinates $(3, -5)$.
- a Find an equation of the line l .
- The straight line m passes through the points with coordinates $(-1, -2)$ and $(4, 1)$.
- b Find the equation of m in the form $ax + by + c = 0$, where a, b and c are integers.
- The lines l and m intersect at the point P .
- c Find the coordinates of P .
- 2 Given that the straight line passing through the points $A(2, -3)$ and $B(7, k)$ has gradient $\frac{3}{2}$,
- a find the value of k ,
- b show that the perpendicular bisector of AB has the equation $8x + 12y - 45 = 0$.
- 3 The vertices of a triangle are the points $A(5, 4)$, $B(-5, 8)$ and $C(1, 11)$.
- a Find the equation of the straight line passing through A and B , giving your answer in the form $ax + by + c = 0$, where a, b and c are integers.
- b Find the coordinates of the point M , the mid-point of AC .
- c Show that OM is perpendicular to AB , where O is the origin.

4



The line l with equation $3x + y - 9 = 0$ intersects the line m with equation $2x + 3y - 12 = 0$ at the point A as shown in the diagram above.

- a Find, as exact fractions, the coordinates of the point A .

The region R_1 is bounded by l , m and the y -axis.

The region R_2 is bounded by l , m and the x -axis.

- b Show that the ratio of the area of R_1 to the area of R_2 is $25 : 18$

- 5 The straight line l has the equation $2x + 5y + 10 = 0$.

The straight line m has the equation $6x - 5y - 30 = 0$.

- a Sketch the lines l and m on the same set of axes showing the coordinates of any points at which each line crosses the coordinate axes.

The points where line m crosses the coordinate axes are denoted by A and B .

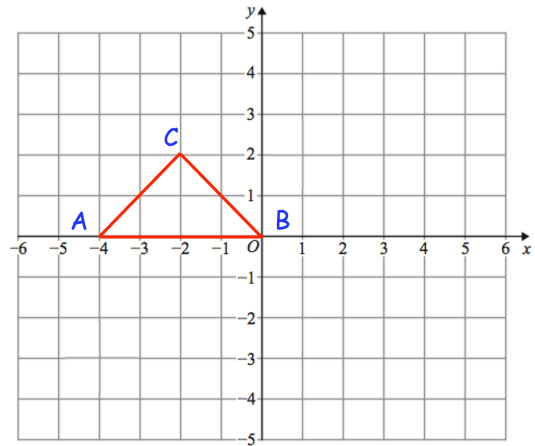
- b Show that l passes through the mid-point of AB .

Apply

Question 1: ABC is a triangle.

Describe fully a **single** transformation of ABC so that:

- (a) None of the vertices are invariant.
- (b) Exactly one vertex is invariant.
- (c) Exactly two vertices are invariant.



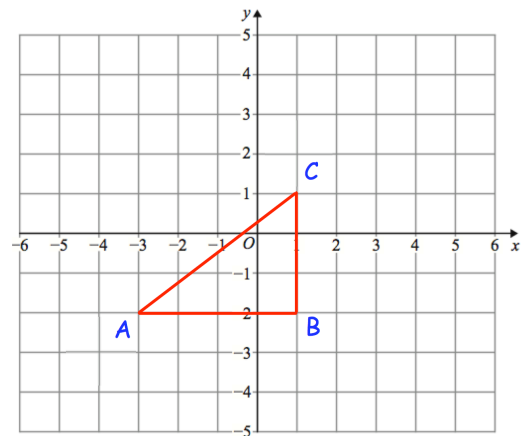
Question 2: Here is triangle ABC

Olivia says "if ABC is reflected in the line $x = -3$ there is one invariant point."

Amelia says "if ABC is reflected in the line $y = -2$ there are two invariant points."

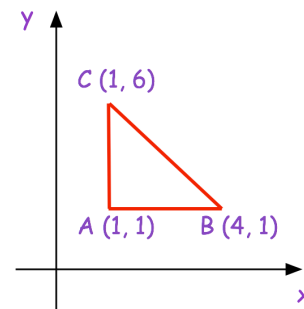
Isla says "if ABC is reflected in the line $x = 1$ there are two vertices that are invariant."

Which student is incorrect? Explain your answer.



Question 3: Here is a sketch of triangle ABC.

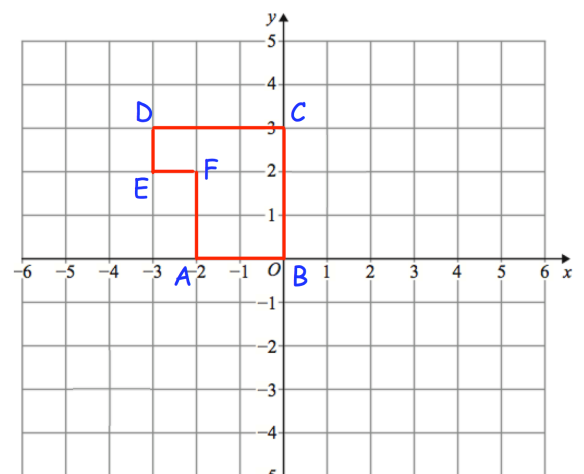
Describe fully a **single** transformation of ABC so that all the points on AC are invariant and the point B is not invariant.



Question 4: Here is shape ABCDEF

Describe fully **single** transformations so that from the six vertices:

- (a) only vertices B and C are invariant.
- (b) only vertex F is invariant.
- (c) only vertices B, D and F are invariant.



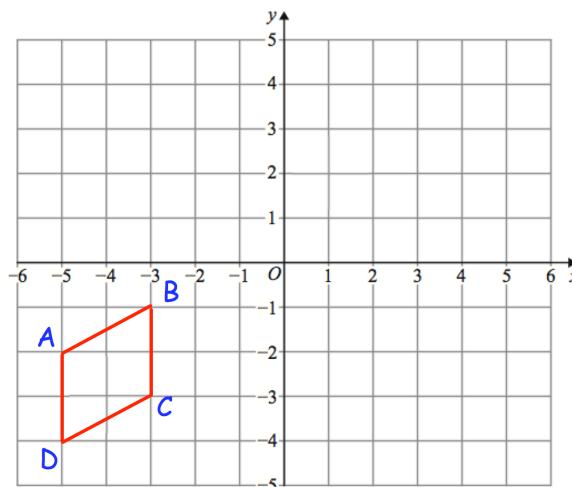
Invariant Points

Video 392 on www.corbettmaths.com

Question 5: Here is quadrilateral ABCD

ABCD is reflected in the line $x = -1$
 followed by a reflection in the line $y = -x$
 followed by a rotation of 180° about $(-1, -1)$

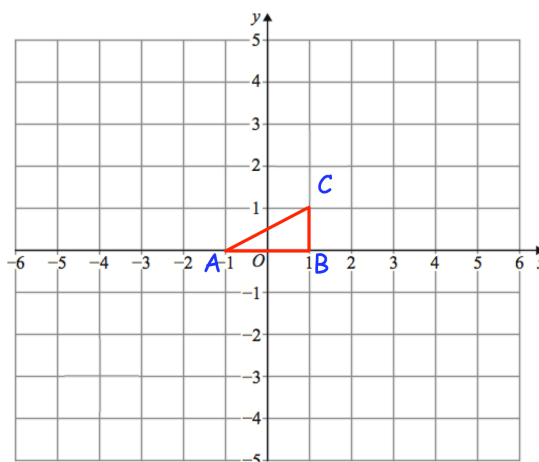
Which of the vertices are invariant?



Question 6: Shown is triangle ABC

ABC is rotated 180° about $(-1, 2)$ and then
 translated by the vector $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$

Write down the coordinate of the invariant point.



Answers



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**GCSE MATHEMATICS
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