Flip

Simplify

a) $2a \times 4b$

b) $2m - n + 3m - 2m^2 - 4n$

c) $7gh \times 2g^2h^2$

Previous

Next

Flip

Expand and Simplify

a) $3a(2b + c) + 3ab$

b) $2p + s - 3(p - s)$

c) $(5x - 3)(2x - 4)$

Previous

Next

Flip

Factorise

a) $6x + 18y$

b) $5gh - 20gt$

c) $4xy^3 - 12x^2y^4$

Previous

Next

Flip

When should you use the quadratic formula?

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Previous

Next

Flip

How would you solve:

a) $x^2 + 7x + 10 = 0$

b) $4x^2 - 2x - 18 = 2$

Previous

Next

Flip

When do you use the *difference of two squares?*

Previous

Next

Flip

How do you solve by *trial and improvement?*

e.g. $x^3 + 2x = 15$
(solution between 2 and 3)

Previous

Next

Flip

Spot the mistake

$$\frac{x}{4} + \frac{x}{5} = 9$$

×4 ×4

$$x + \frac{x}{5} = 36$$

×5 ×5

$$x + x = 180$$

$$2x = 180$$

$$x = 90$$

Previous

Next

Flip

What does the equation $y=mx+c$ represent?

Previous

Next

Flip

If you know the gradient of a line and a coordinate it passes through, how do you find the value of c?

e.g. a line has gradient 3 and passes through (2, 10)

Flip

Which of the lines would be parallel?

$y = \frac{2}{3}x + 6$ (a)

$y = -3x - 1$ (b)

$y = -\frac{1}{3}x + 1$ (c)

$y = -\frac{3}{2}x + 5$ (d)

$y = \frac{2}{3}x - 2$ (e)

Which of the lines would be perpendicular?

Previous

Next

Flip

How do you find the gradient between two points?

e.g. $(2,7)$ and $(7,-3)$

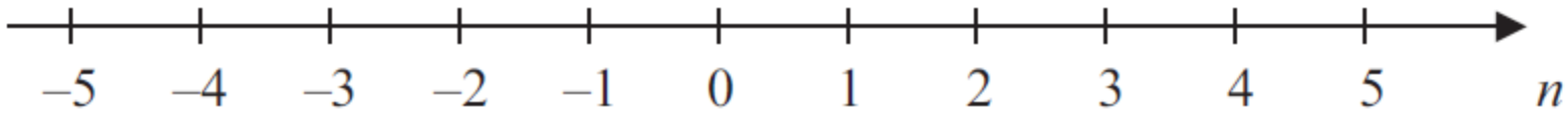
Previous

Next

Flip

What must you remember if you have to:

a) Represent an inequality on a number line



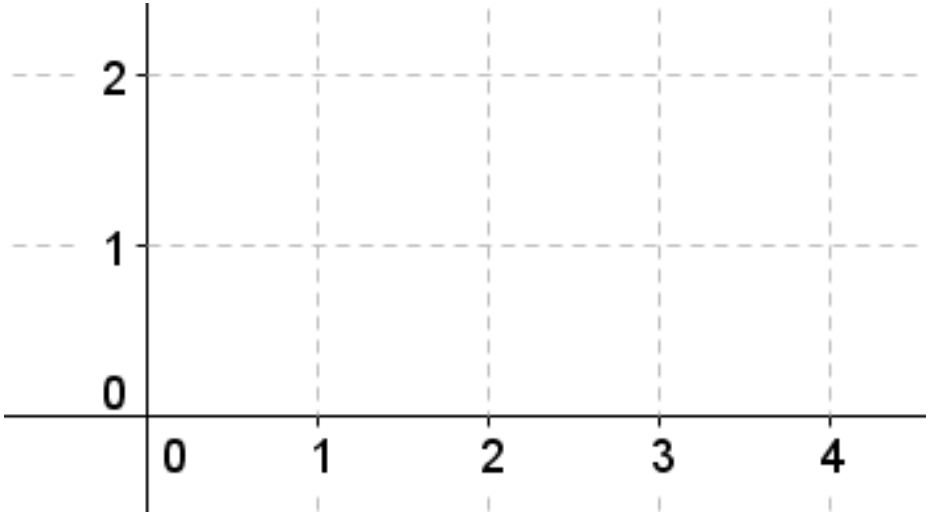
e.g. $-3 < n \leq 5$

b) Shade a region given by inequalities

e.g. $y + x < 2$

$x \geq 0$

$y \leq 1$



Flip

Let a=-2.5 and b=5

Pupil (a) calculates $2a^2 + 2b = 22.5$

Pupil (b) calculates $2a^2 + 2b = -2.5$

Who is correct?
What mistake was made?

Flip

How do you find the nth term of a sequence?

e.g. 3, 9, 15, 21, …

Previous

Next

Flip

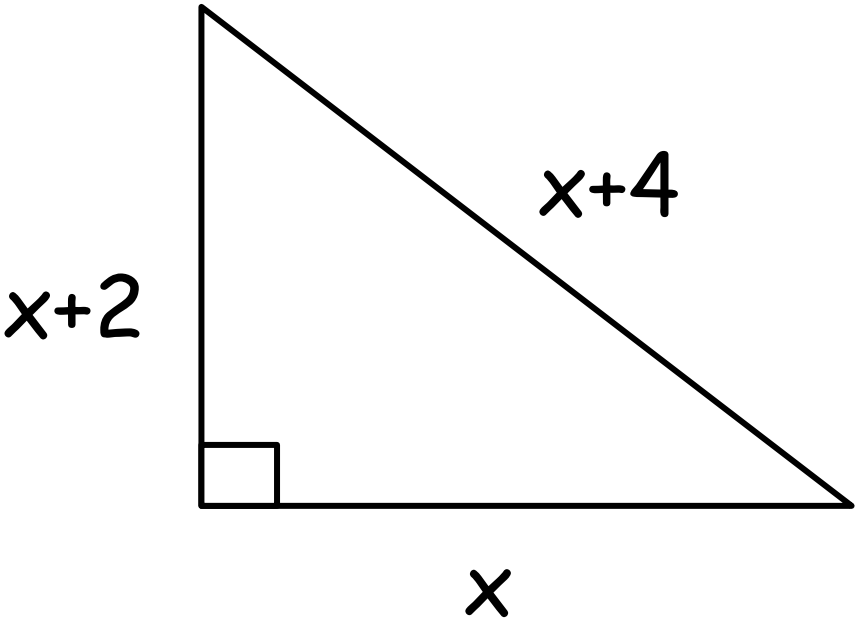
When do you need to factorise into double brackets?

Previous

Next

Flip

How could you use the information provided to form an equation?



Can you solve it?

Previous

Next

Flip

Make n the subject of the formula

a) $$p = 5n - 4$$

b) $$3n + an = 2p - 4$$

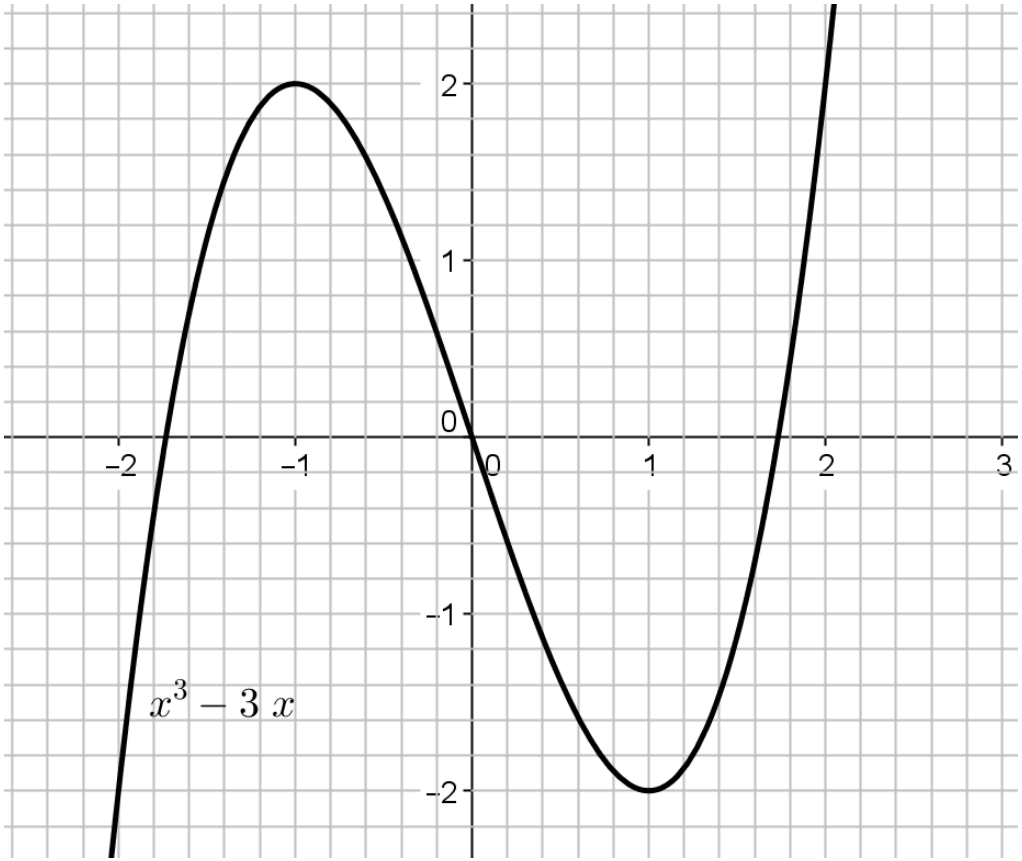
Previous

Next

Flip

How do you *estimate* the solution for an equation from a graph?

e.g. Estimate the solutions for $x^3 - 3x = 1$



Previous

Next

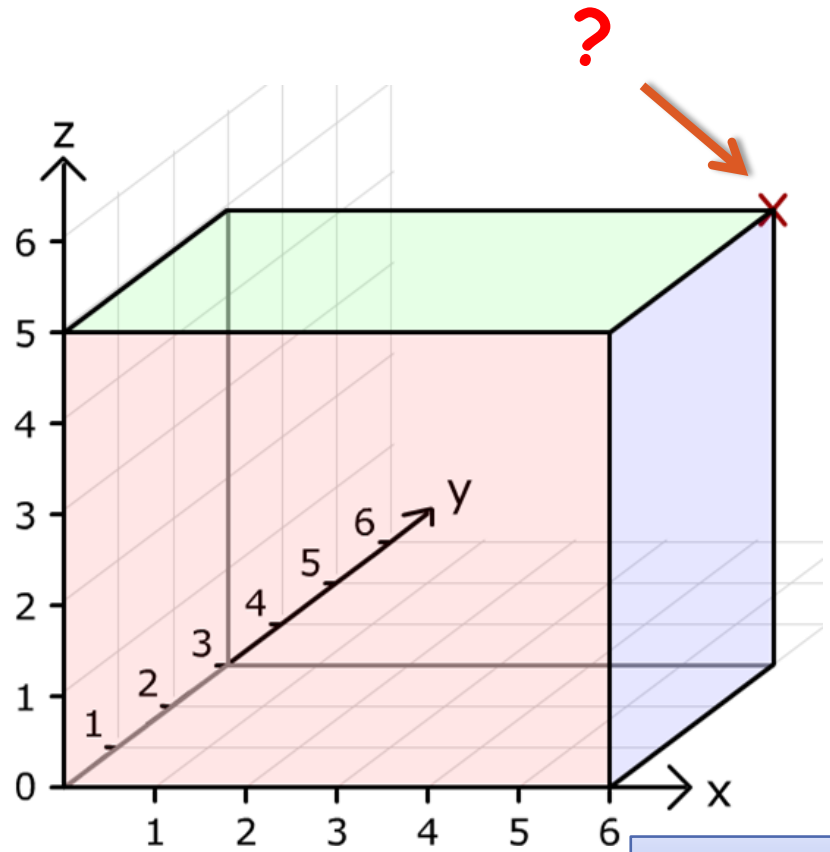
Flip

a) How do you find the midpoint of 2 coordinates?

E.g. (3, 8, 1) and (5, 0, -2)

b) How do you find coordinates in 3D?

E.g.



Previous

Next

Flip

Solve the following simultaneous equations

$$4a - 7b = 13$$
$$2a - 2b = 10$$

Previous

Next

Flip

Solve

$$\frac{7}{x-3} = \frac{5}{x-2}$$

Previous

Next

Flip

Write an equation to match the statement *"P is inversely proportional to Q squared"*

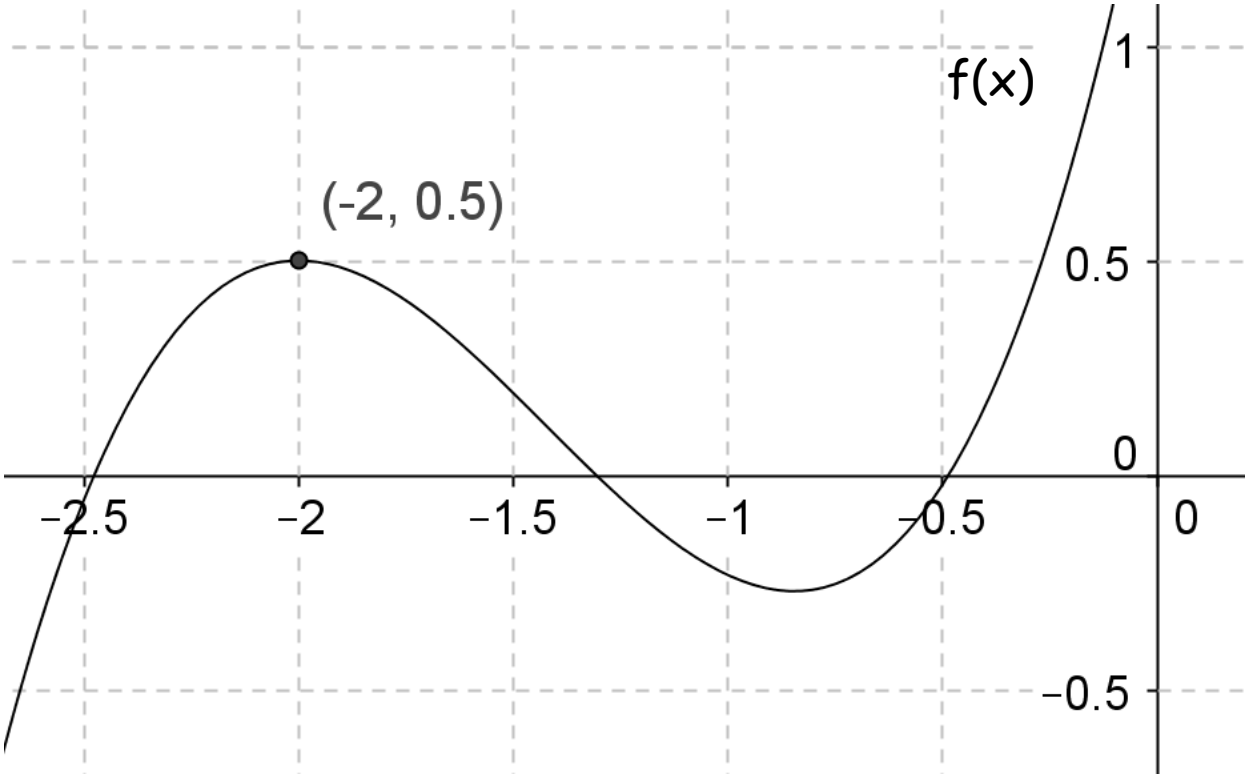
When P=18, Q=2. What will Q be when P=8?

Previous

Next

Flip

Where will the point move under the following transformations?



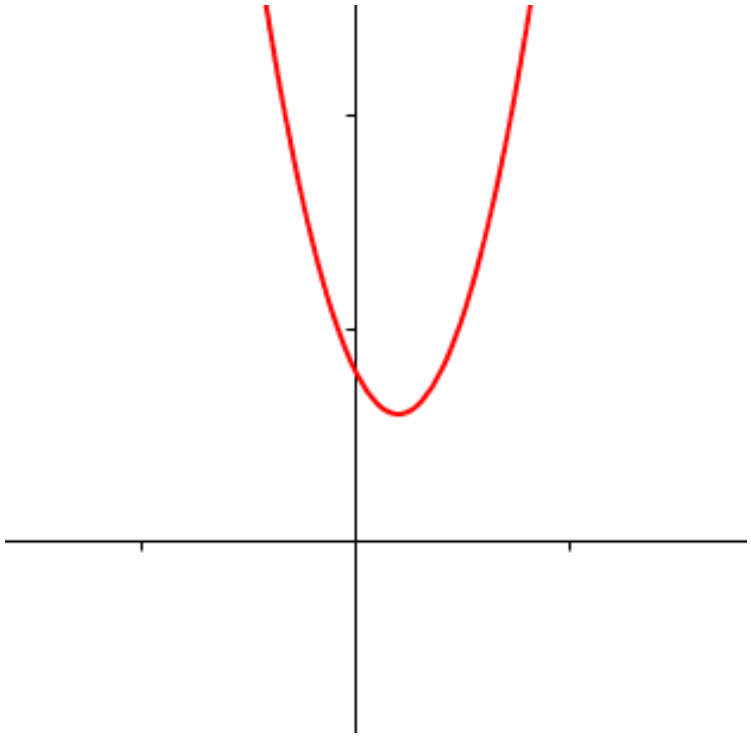
a) $f(x) + 1$

b) $f(\frac{1}{2}x)$

c) $3f(x + 1)$

Flip

By completing the square, find the minimum point of the equation $y = x^2 - 2x + 4$



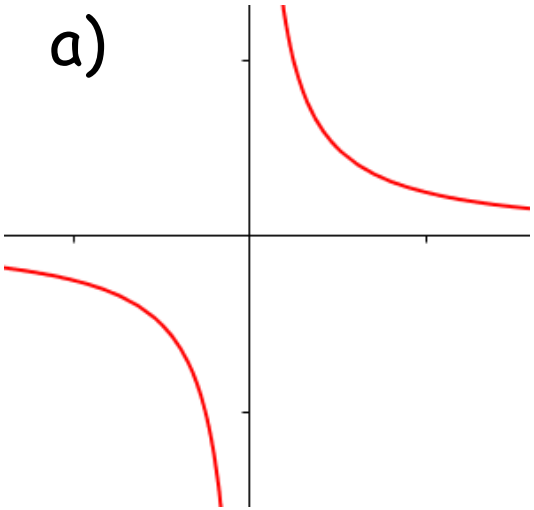
Previous

Next

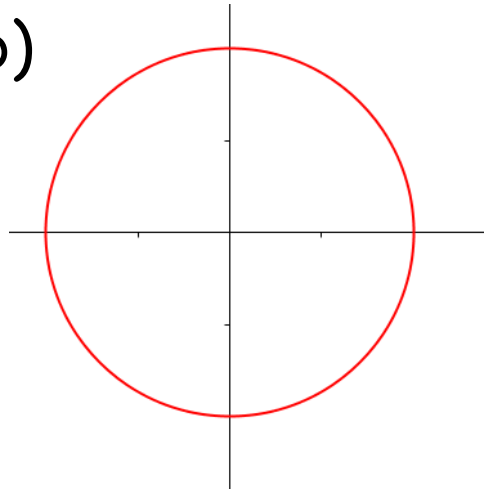
Flip

Which of the following equations match the graphs?

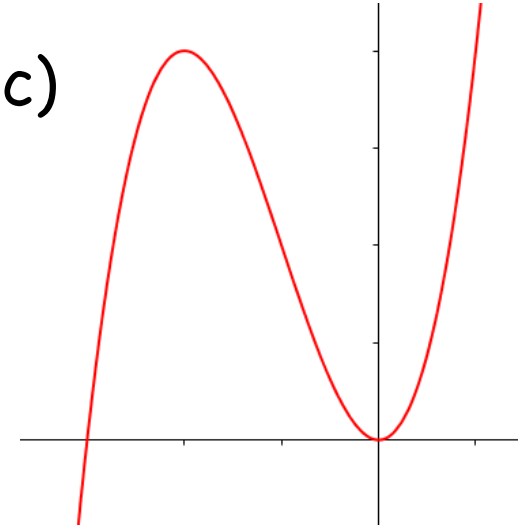
a)



b)



c)



$x^2 + y^2 = 4$

$y = \frac{1}{x}$

$y = x^3 + 3x^2$

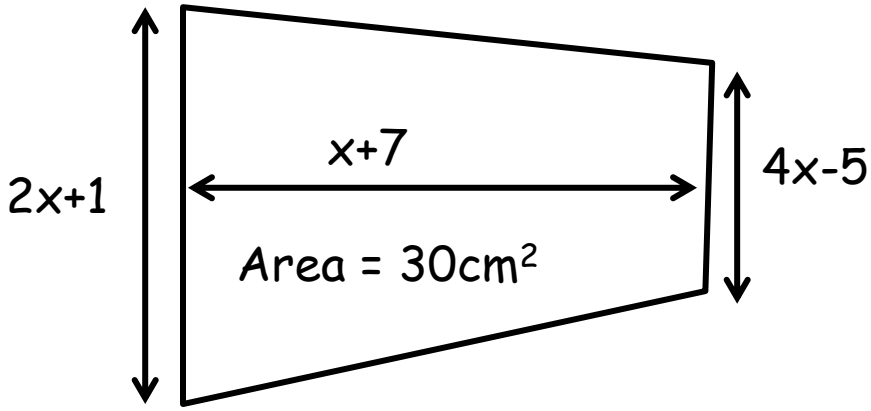
$y = 2x^2 - 5$

$y = 5x + 1$

$y = \sin(x)$

Flip

Use the information to form an equation



What is the length of the shortest side?

Previous

Next

Answer 1

$a)\ 8ab$

$b)\ -2m^2 + 5m - 5n$

$c)\ 14g^3h^3$

Answer 2

$a)\ 9ab\ + 3ac$

$b)\ -p + 4s$

$c)\ 10x^2 - 26x + 12$

Answer 3

$a)\ 6(x+3y)$

$b)\ 5g(h-4t)$

$c)\ 4xy^3(1-3xy)$

Answer 4

Solving quadratics when either:

a) You are told to give your answer to
… **decimal places** or **significant figures**

b) Coefficient of x^2 is greater than 1
(e.g. $5x^2 - 7x + 14$)

Note. You can always use the quadratic formula to solve, it's just not always the fastest method

Answer 5

a) Factorise

$$(x+5)(x+2)=0$$

$$x=-5\ or\ -2$$

b) Rearrange so equals 0,

$$4x^2-2x-20=0$$

then use quadratic formula

$$a=4, b=-2, c=-20$$

Solutions are x=2.5 or -2

Answer 6

Quadratics in the form $x^2 -$ .....

e.g. $x^2 - 9$ $x^2 - 16$ $4x^2 - 25$

=(x+3)(x-3) =(x+4)(x-4) =(2x+5)(2x-5)

Answer 7

1. Test number to narrow down halfway

Test 2.5: $2.5^3 + 2 \times 2.5 = 20.625$ Too big

2. Find which 1dp values are closest

Test 2.3: $2.3^3 + 2 \times 2.3 = 16.767$ Too big

Test 2.2: $2.2^3 + 2 \times 2.2 = 15.048$ Too big

Test 2.1: $2.2^3 + 2 \times 2.2 = 13.461$ Too small

3. Test halfway between to see which is closest

Test 2.15: $2.15^3 + 2 \times 2.15 = 14.238$ Too small

$$\boldsymbol{x = 2.2\ (1dp)}$$

Answer 8

When multiplying both sides, you must multiply **every term**

$$\frac{x}{4} + \frac{x}{5} = 9$$

x4 x4 x4

$$x + \frac{4x}{5} = 36$$

x5 x5 x5

$$5x + 4x = 180$$

$$9x = 180$$

$$\boldsymbol{x = 20}$$

Answer 9

Equation of a straight line

‘m’ is the gradient

‘c’ is where it crosses the y-axis, point (0,c)

Answer 10

Substitute the coordinates into the equation

Gradient = 3

Equation $y = 3x + c$ passes through (2,10)

x y

$$10 = 3(2) + c$$

$$10 = 6 + c$$

$$\boldsymbol{c = 4}$$

$$y = 3x + 4$$

Answer 11

Parallel have same gradient (coefficient of x)

(a) is parallel to (e)

Perpendicular have *negative reciprocal* gradient

(a) is perpendicular to (d)
(e) is perpendicular to (d)

Answer 12

Gradient is $\frac{rise}{run}$, which means $\frac{change\ in\ y-coordinates}{change\ in\ x-coordinates}$

(2, 7)

+5 ↓ ↓ -10

(7, -3)

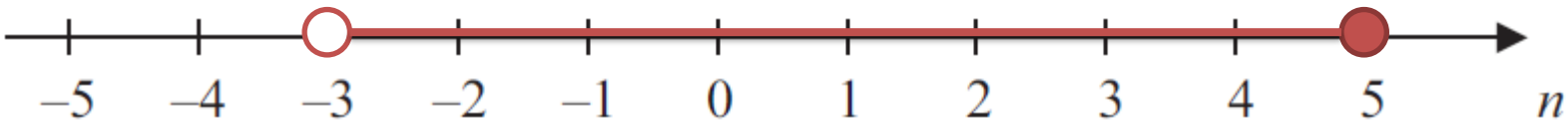
$$\text{Gradient} = -\frac{10}{5}$$

$$= -2$$

Answer 13

Open circle does not include number < or >

Closed circle does include number $\leq$ *or* $\geq$



$$-3 < n \leq 5$$

Dashed line does not include number < or >

Solid line does include number $\leq$ *or* $\geq$

e.g. $y + x < 2$

$x \geq 0$

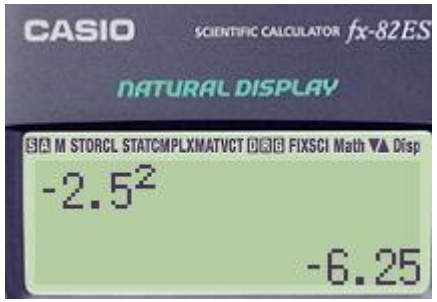
$y \leq 1$

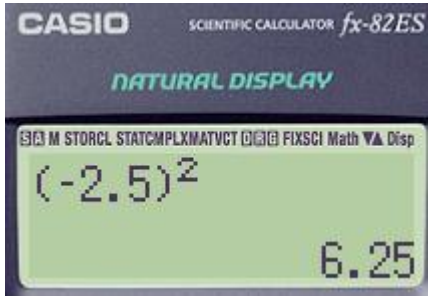
Answer 14

Pupil a is correct

When you square a negative number on your calculator you must either put it into brackets or leave out the - sign

$$a^2 = 6.25$$





Answer 15

Find the common difference, that is the start of the formula

e.g. 3, 9, 15, 21, …

Difference between each number is 6

Formula = 6n $\pm$ …..

Write the times tables and see how to get to each number

6 12 18 24

↓ ↓ ↓ ↓

3, 9, 15, 21, …

-3 each time

Formula = 6n – 3

Answer 16

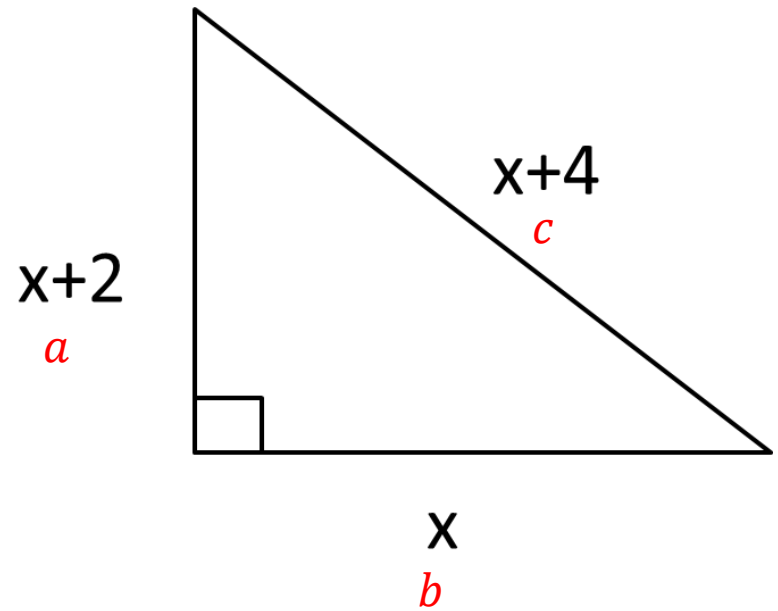
Only if the question is a quadratic (x^2) and contains a constant number term

Yes	No
$\boldsymbol{x^2} + 2x - \mathbf{3}$	$\boldsymbol{x^2} + 2x$
$\boldsymbol{x^2} - \mathbf{49}$	$3x - \mathbf{12}$
$\mathbf{3}\boldsymbol{x^2} + 5x + \mathbf{2}$	$8x^2y - 12y^3$

Answer 17

Right angle triangle so can use pythagoras' theorem

$$\boldsymbol{a^2 + b^2 = c^2}$$



$$(x+2)^2 + x^2 = (x+4)^2$$

$$(x+2)(x+2) + x^2 = (x+4)(x+4)$$

$$2x^2 + 4x + 4 = x^2 + 8x + 16$$

$$x^2 - 4x - 12 = 0$$

$$(x+2)(x-6) = 0$$

$$\boldsymbol{x = 6}$$

(ignore x=-2 as length should be positive)

Answer 18

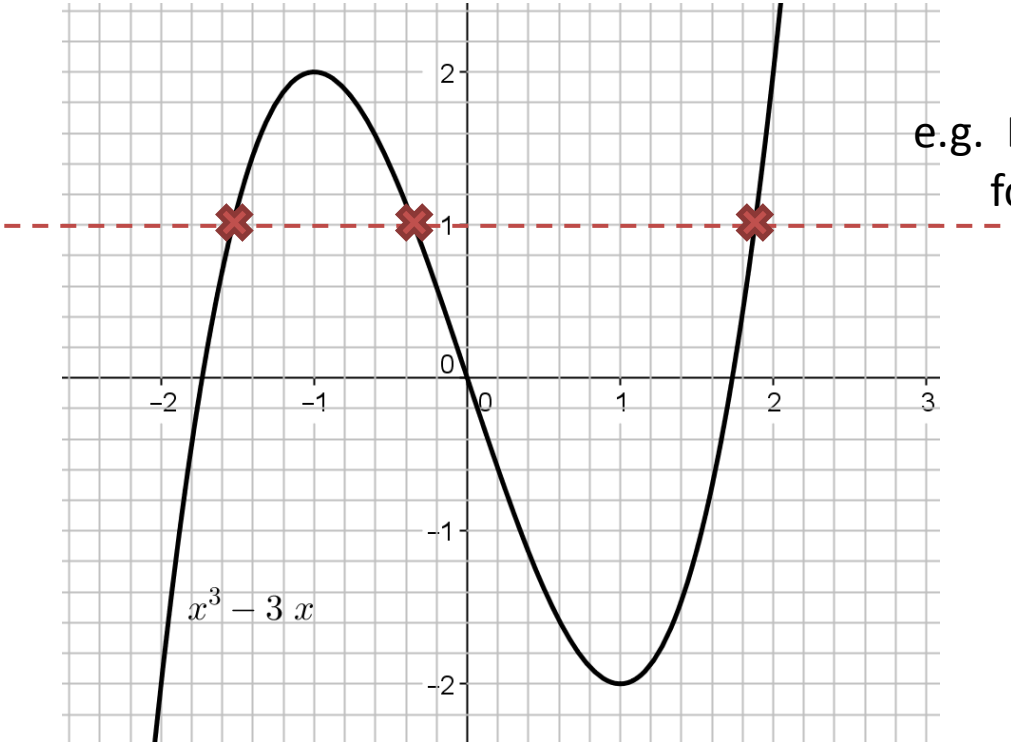
$$P = 5n - 4$$
$$P + 4 = 5n$$
$$\frac{p+4}{5} = n$$

$$3n + an = 2p - 4$$
$$n(3 + a) = 2p - 4$$
$$n = \frac{2p-4}{3+a}$$

Answer 19

The number after the equals sign is the value for y.

Look at where the graph has this value
(if =0 then that is the x-axis)



e.g. Estimate the solutions for $x^3 - 3x = \mathbf{1}$

Solutions (where y=1) are roughly when

$\boldsymbol{x = -1.5}$
$\boldsymbol{x = -0.3}$
$\boldsymbol{x = 1.9}$

Answer 20

a) Find the point halfway between each pair coordinates

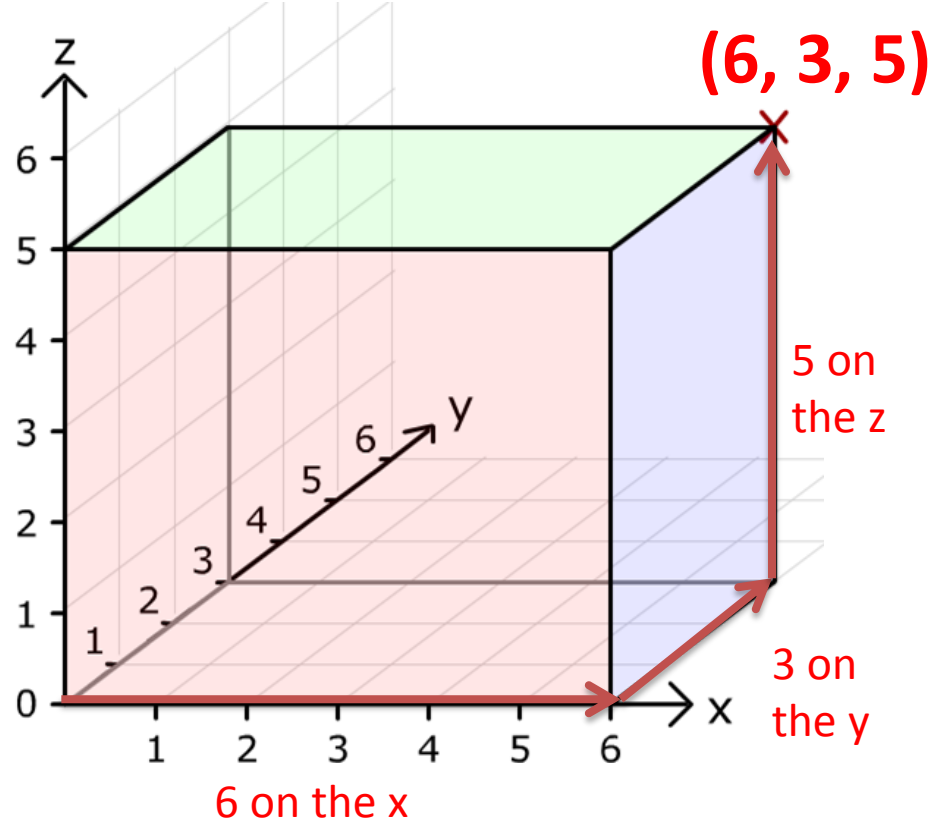
$(3,\ 8,\ 1)$

(4, 4, -0.5)

$(5,\ 0,\ -2)$

b) You have 3 directions for travel (x, y and z)

Imagine how you would get to the point travelling only in those directions



Answer 21

$$4a - 7b = 13 \xrightarrow{\text{No change}} 4a - 7b = 13$$

$$2a - 2b = 10 \xrightarrow[\times 2]{} 4a - 4b = 20$$

$$-3b = -7$$

$$b = \frac{7}{3}$$

Sub $b = \frac{7}{3}$ into either of first equations

$$4a - 7\left(\frac{7}{3}\right) = 13$$

$$4a = 13 + \frac{49}{3}$$

$$a = \frac{22}{3}$$

Answer 22

$$\frac{7}{x-3} = \frac{5}{x-2}$$

$$7 = \frac{5(x-3)}{x-2}$$

$$7(x-2) = 5(x-3)$$

$$7x - 14 = 5x - 15$$

$$2x = -1$$

$$x = -\frac{1}{2}$$

Answer 23

$$P \propto \frac{1}{Q^2}$$

$$P = \frac{k}{Q^2}$$

Find the constant term k

$$PQ^2 = k$$

When P=18, Q=2

$$18(2^2) = k$$

$$72 = k$$

Use to find other values

When P=8, Q=???

$$8(Q^2) = 72$$

$$Q^2 = 9$$

$$Q = 3$$

Answer 24

a) (-2,1.5) y-coordinates +1

b) (-4,0.5) x-coordinates **double**

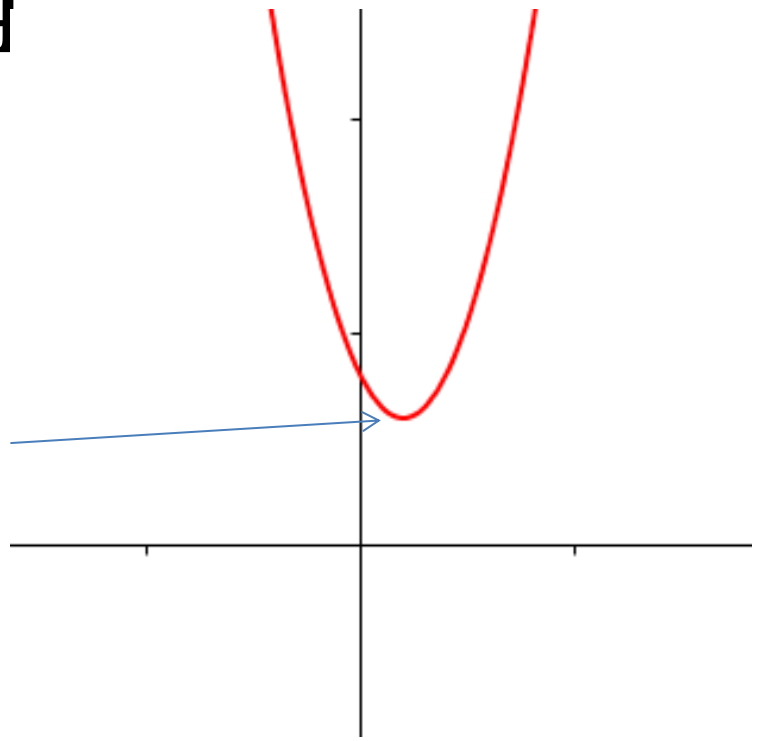
c) (-5,1.5) y-coordinates multiply by 3
x-coordinates **subtract** 1

Answer 25

$$y = x^2 - 2x + 4$$

$$= (x - 1)^2 + 3$$

$$coordinates\ (1,3)$$



Answer 26

a) $y = \frac{1}{x}$ reciprocal graph

b) $x^2 + y^2 = 4$ Equation of circle

c) $y = x^3 + 3x^2$ Cubic graph (2 turning points)

Answer 27

Area of trapezium:

$$\frac{1}{2}\underbrace{(a+b)}_{6x-4}h$$

$$\frac{1}{2}(6x-4)(x+7)=30cm^2$$

$$\frac{1}{2}(6x^2+38x-28)=30cm^2$$

$$3x^2+19x-14=30$$

$$3x^2+19x-44=0$$

$$\boldsymbol{x=1.8cm}$$