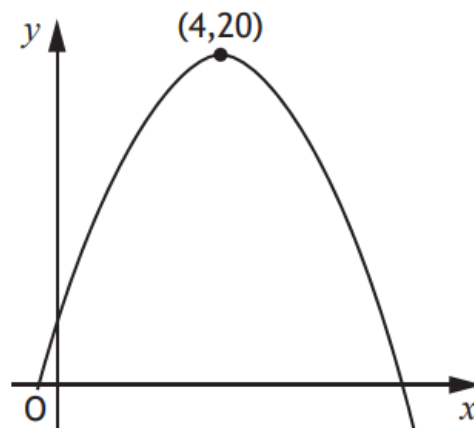


# Parabolas

## N5 Maths Exam Questions

Source: 2019 P1 Q9 N5 Maths

(1) The graph shows a parabola.



The maximum turning point has coordinates  $(4,20)$  as shown in the diagram.

(a) Write down the equation of the axis of symmetry of the graph.

The equation of the parabola is of the form  $y = b - (x + a)^2$ .

(b) State the values of

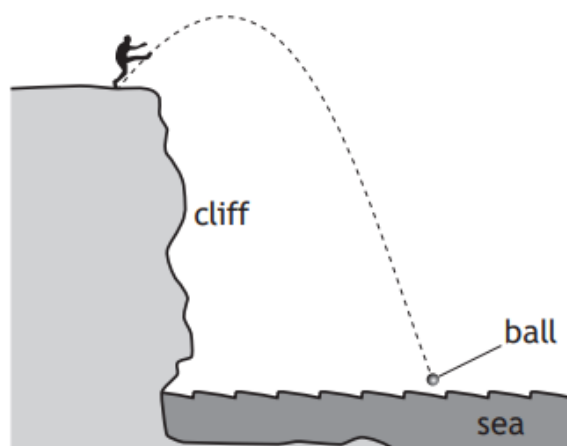
(i)  $a$

(ii)  $b$ .

Answer: (a)  $x = 4$

(b)(i)  $a = -4$  (ii)  $b = 20$

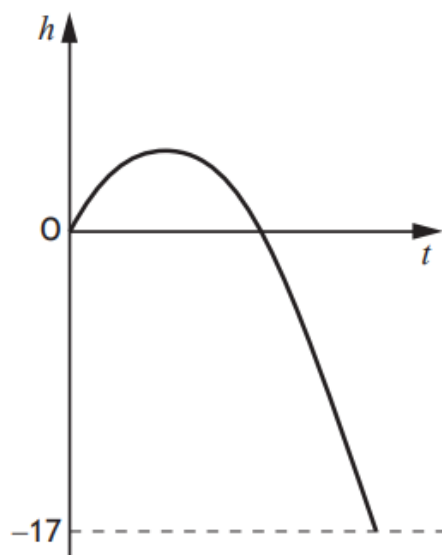
- (2) A ball is kicked from a clifftop.



The height,  $h$  metres, of the ball relative to the clifftop after  $t$  seconds is given by  $h = 12t - 5t^2$ .

- (a) Calculate the height of the ball above the clifftop after 2 seconds.

The graph below represents the height,  $h$  metres, of the ball relative to the clifftop after  $t$  seconds.



The sea is 17 metres below the clifftop.

- (b) After how many seconds will the ball hit the sea?

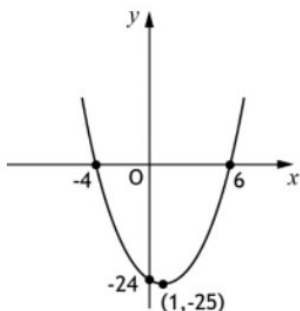
Answer: (a)  $4m$  (b)  $\frac{17}{5}$  seconds

Source: 2018 P1 Q16 N5 Maths

(3) Sketch the graph of  $y = (x - 6)(x + 4)$ .

On your sketch, show clearly the points of intersection with the  $x$ -axis and the  $y$ -axis, and the coordinates of the turning point.

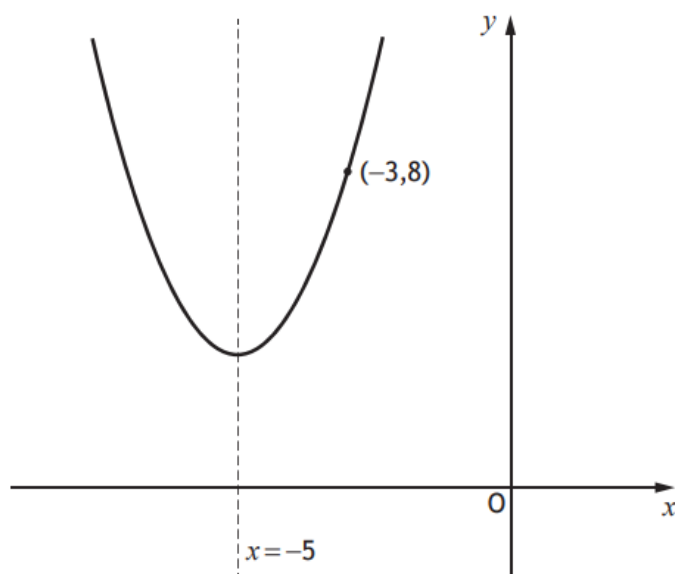
Answer:



Source: 2017 P1 Q14 N5 Maths

(4)

The graph below shows a parabola with equation of the form  $y = (x + a)^2 + b$ .



The equation of the axis of symmetry of the parabola is  $x = -5$ .

(a) State the value of  $a$ .

The point  $(-3, 8)$  lies on the parabola.

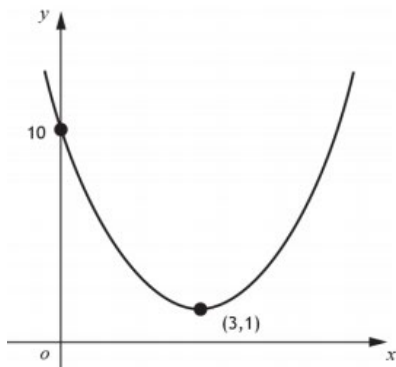
(b) Calculate the value of  $b$ .

Answer:  $a = 5$ ,  $b = 4$

Source: 2016 P1 Q10 N5 Maths

- (5) Sketch the graph of  $y = (x - 3)^2 + 1$ .  
On your sketch, show clearly the coordinates of the turning point and the point of intersection with the  $y$ -axis.

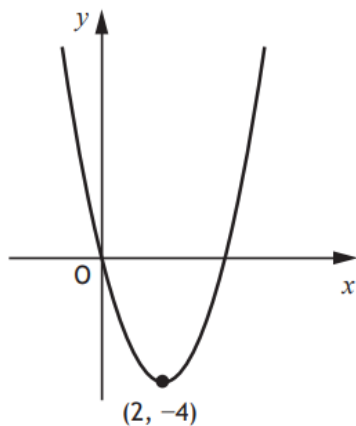
Answer:



Source: 2015 P1 Q7 N5 Maths

- (6) The graph below shows part of the parabola with equation of the form

$$y = (x + a)^2 + b.$$



The minimum turning point  $(2, -4)$  is shown in the diagram.

(a) State the values of

(i)  $a$

(ii)  $b$ .

(b) Write down the equation of the axis of symmetry of the graph.

Answer: (a) (i)  $a = -2$       (ii)  $b = -4$   
(b)  $x = 2$