

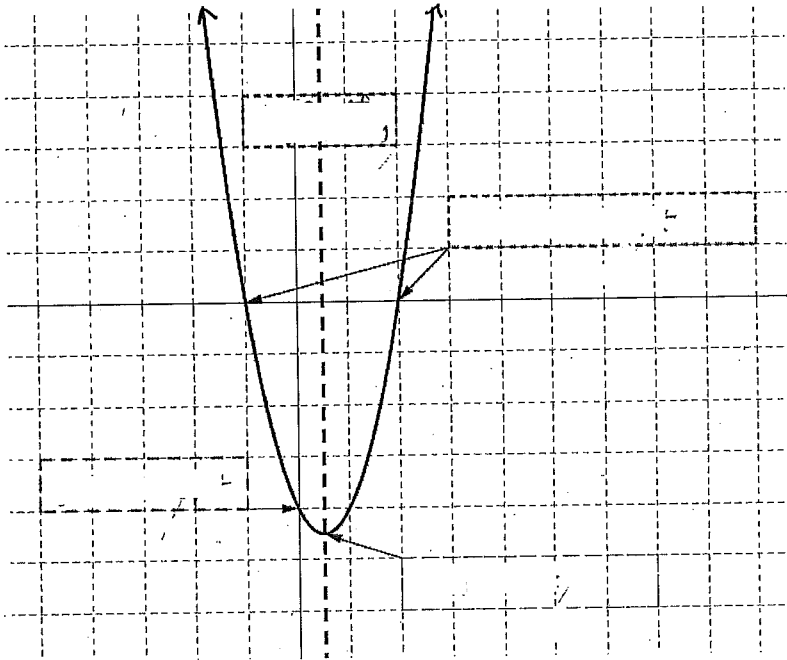


STUDENT NAME _____

SYDNEY GIRLS H.S. - YRID

THE PARABOLA AND OTHER NUMBER PLANE GRAPHS TOPIC TEST

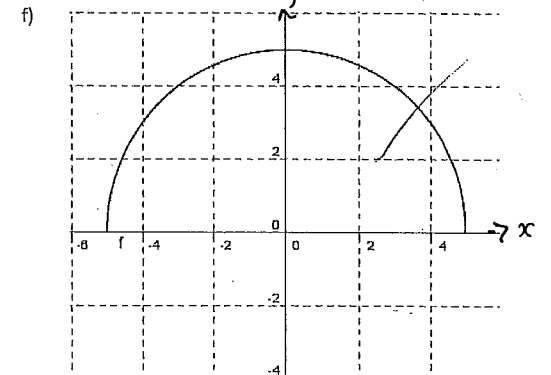
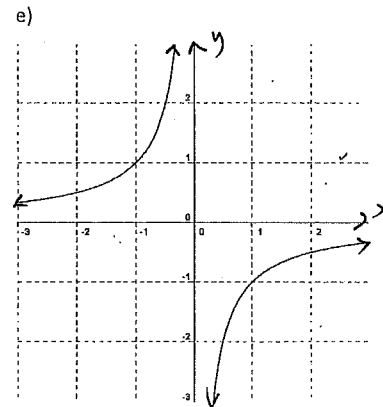
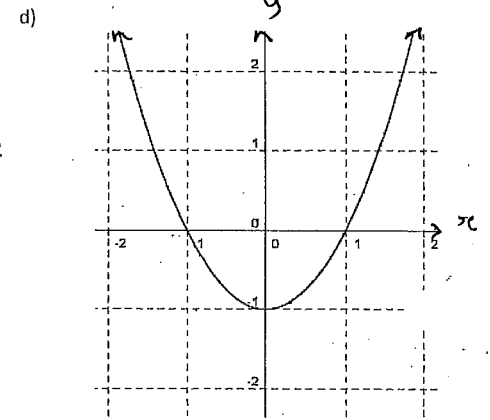
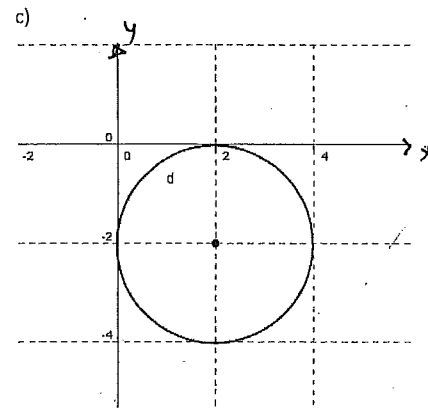
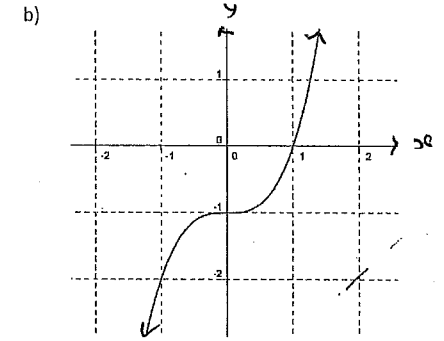
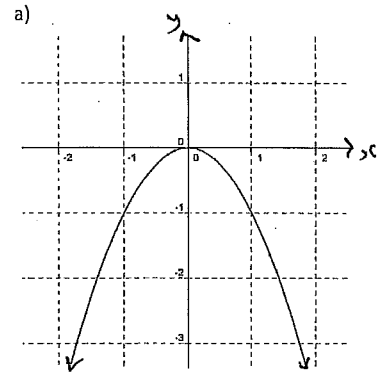
1. Complete the feature of the given graph .



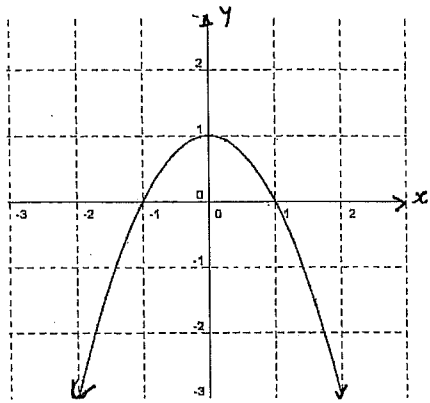
2. Match each equation with its sketch (please write the equation under its sketch)

$y = -x^2$, $y = x^2 - 1$, $y = -x^2 + 1$, $y = x^3 - 1$

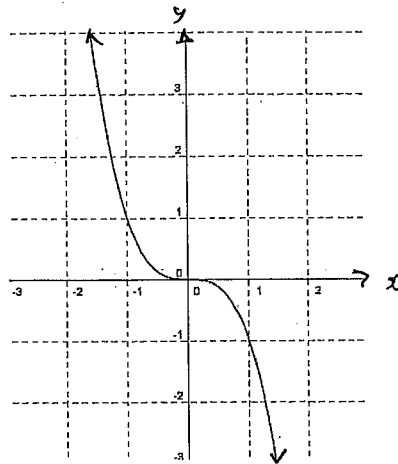
$y = \frac{-1}{x}$, $(x-2)^2 + (y+2)^2 = 4$, $y = \sqrt{25-x^2}$, $y = -x^3$



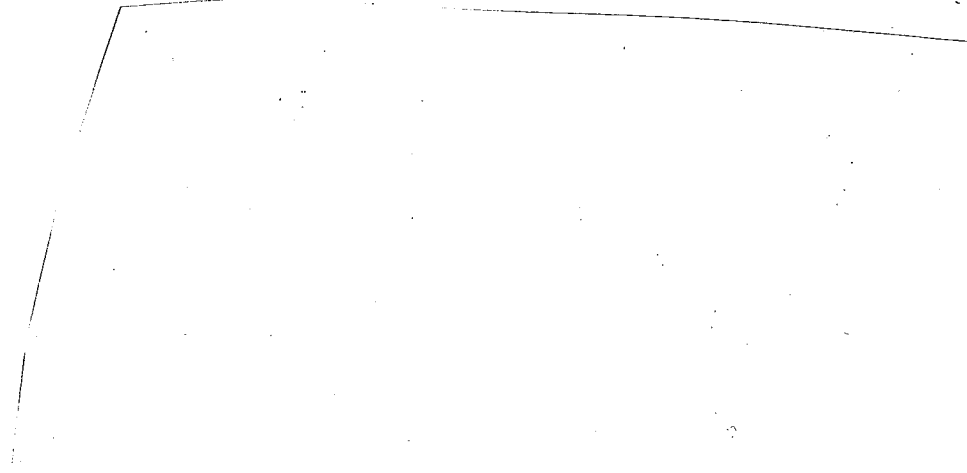
g)



h)



v) Sketch the parabola, indicating all the features above



3.

For the parabola $y = x^2 - 4x - 12$

Find

i) the y -intercept

ii) the x -intercept

iii) the axis of symmetry

iv) the vertex

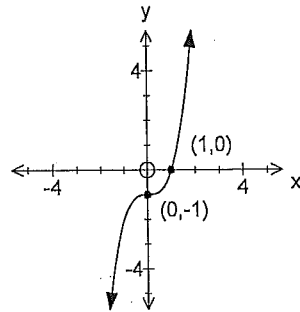
4. Find the length of the radius in each circle. Answer in simplest surd form where appropriate.

a) $x^2 + y^2 = 49$

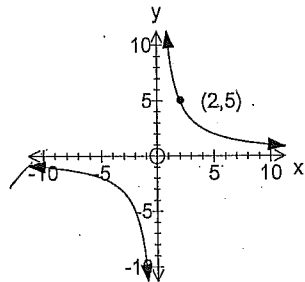
b) $x^2 + y^2 = 23$

c) $x^2 + y^2 = 12.25$

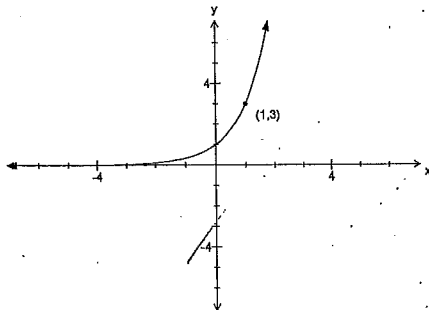
5. Find the equation of given curve (use $= ax^3 + d$)



6. Find the equation of hyperbola ($y = \frac{k}{x}$)



7. Determine the equation of the given graph

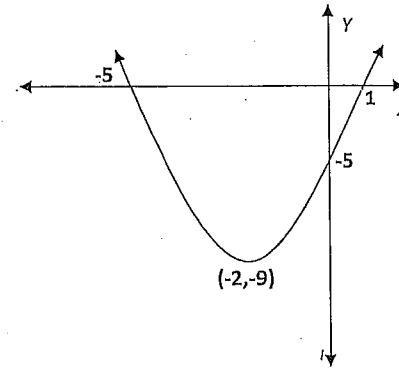


8.

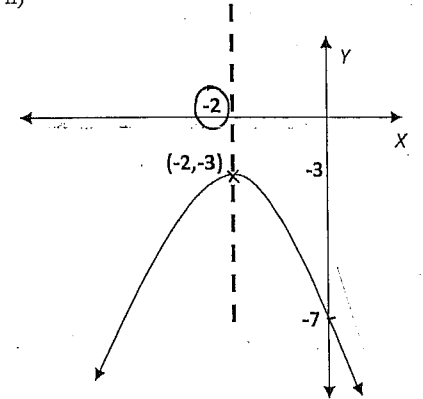
Determine the equations of the parabolas below

Leave your answer in the form $y = ax^2 + bx + c$

i)



ii)



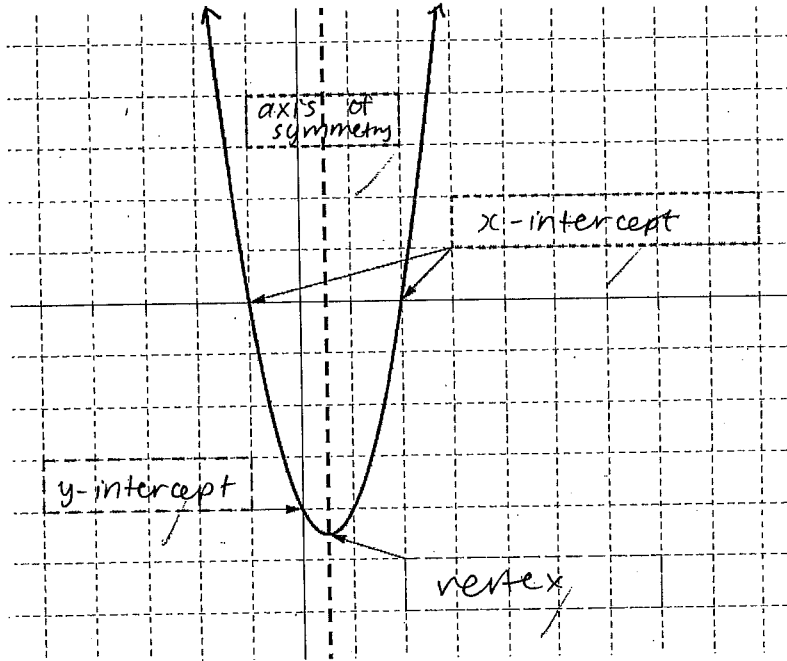


STUDENT NAME _____

39
39

THE PARABOLA AND OTHER NUMBER PLANE GRAPHS TOPIC TEST

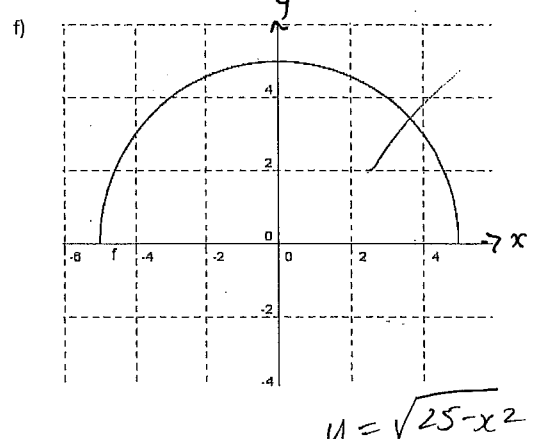
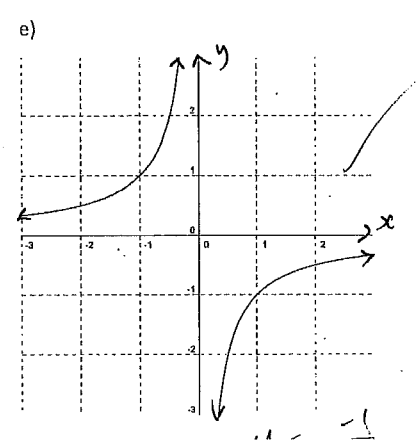
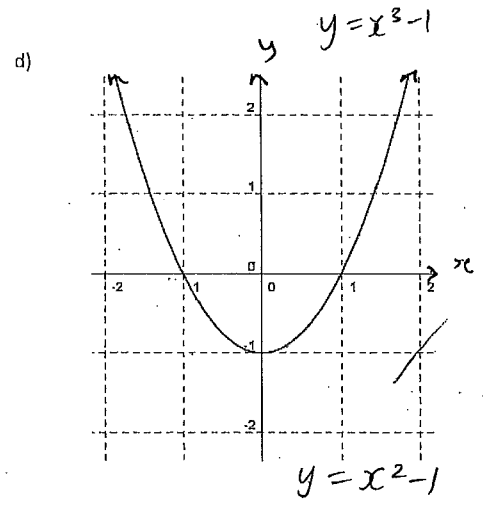
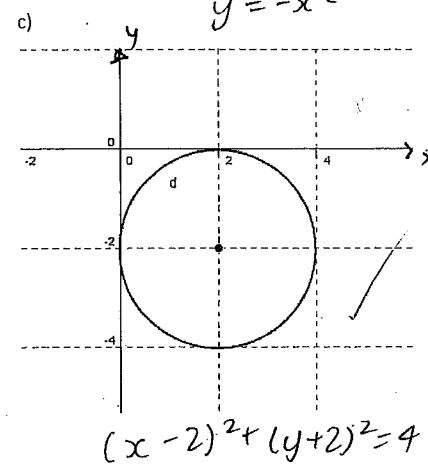
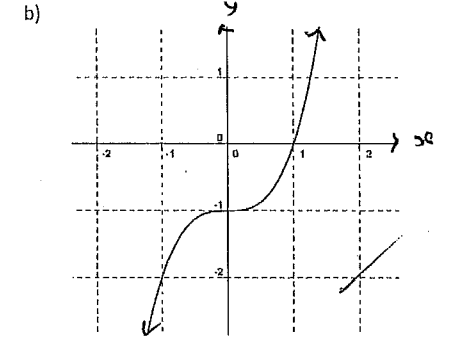
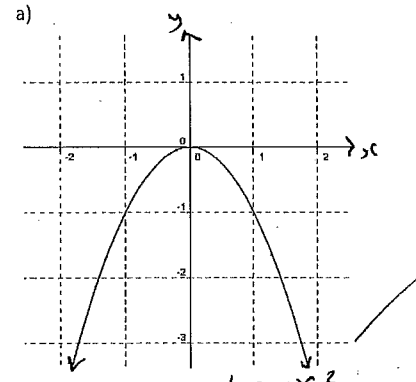
1. Complete the feature of the given graph.



4

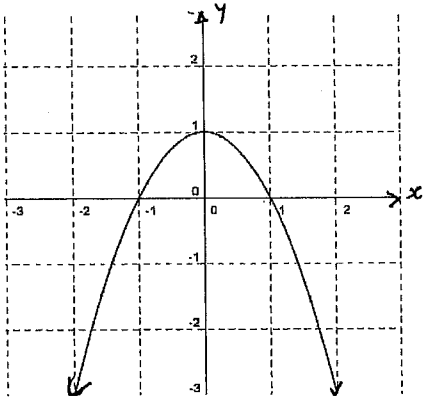
2. Match each equation with its sketch (please write the equation under its sketch)

- $y = -x^2$, $y = x^2 - 1$, $y = -x^2 + 1$, $y = x^3 - 1$
 $y = \frac{-1}{x}$, $(x-2)^2 + (y+2)^2 = 4$, $y = \sqrt{25-x^2}$, $y = -x^3$



6

g)



$y = -x^2 + 1$

3.

For the parabola $y = x^2 - 4x - 12$

Find

i) the y-intercept

or

let $x = 0$
 $y = (0)^2 - 4(0) - 12$
 $\therefore y\text{-int} = -12$

ii) the x-intercept

$p = -12$
 $q = -4$
 $r = 6, 2$

$y = x^2 - 4x - 12$
 $y = x^2 + 2x - 6x - 12$
 $y = x(x+2) - 6(x+2)$
 $y = (x-6)(x+2)$

iii) the axis of symmetry

$x = \frac{-b}{2a}$

$x = \frac{-(-4)}{2(1)}$

$x = \frac{4}{2}$

$x = 2$

\therefore axis of symmetry = 2

iv) the vertex

Sub $x = 2$ into the eq: $y = x^2 - 4x - 12$

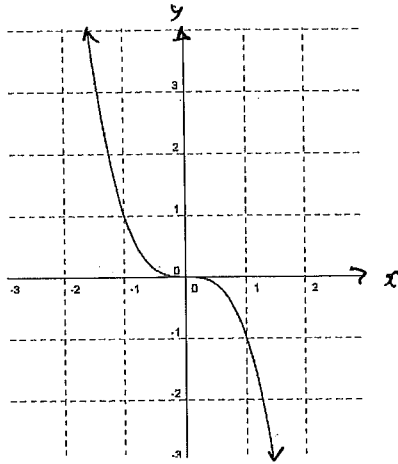
$y = (2)^2 - 4(2) - 12$

$y = 4 - 8 - 12$

$y = -4 - 12$

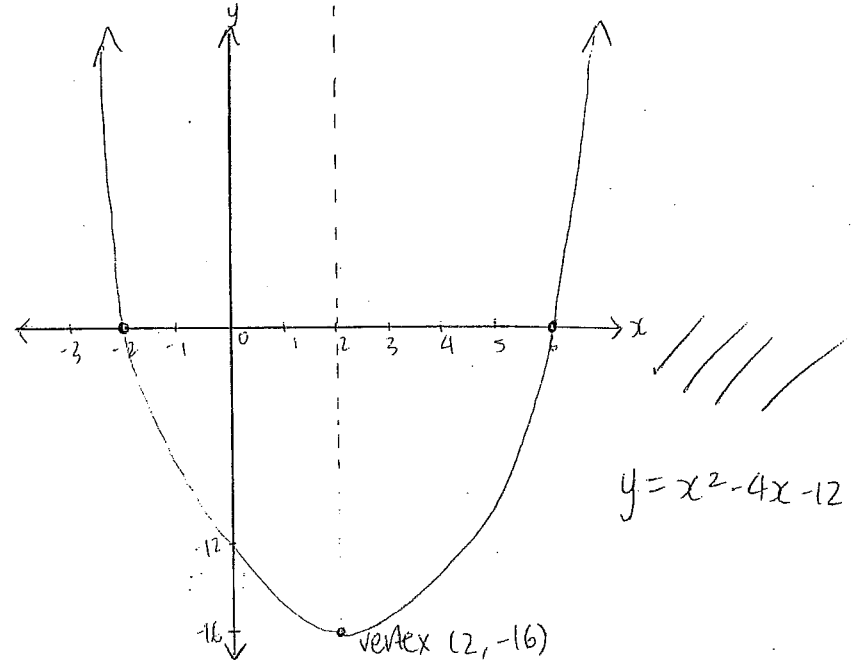
$y = -16$

h)



$y = -x^3$

v) Sketch the parabola, indicating all the features above



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

4. Find the length of the radius in each circle. Answer in simplest surd form where appropriate.

a) $x^2 + y^2 = 49$

$x^2 + y^2 = r^2$

$r^2 = 49$

$r = \sqrt{49}$

\therefore radius = 7 units

b) $x^2 + y^2 = 23$

$x^2 + y^2 = r^2$

$r^2 = 23$

\therefore radius = $\sqrt{23}$ units

c) $x^2 + y^2 = 12.25$

$x^2 + y^2 = r^2$

$r^2 = 12.25$

$r = \sqrt{12.25}$

\therefore radius = 3.5 units

5. Find the equation of given curve (use $y = ax^3 + d$)

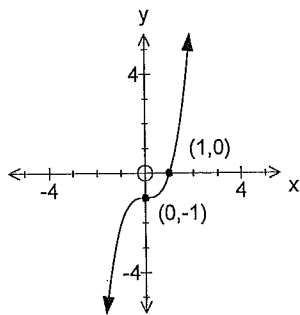
$$y = ax^3 + d$$

sub in point $(1, 0)$

$$0 = a(1)^3 - 1$$

$$1 = a$$

\therefore equation is: $y = x^3 - 1$



6. Find the equation of hyperbola ($y = \frac{k}{x}$)

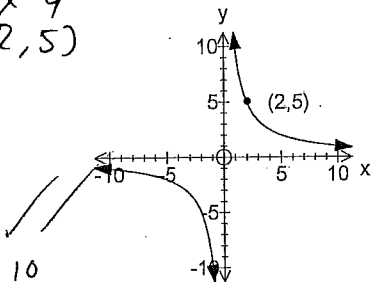
$y = \frac{k}{x}$, sub in point $(2, 5)$

$$5 \times 2 = \frac{k}{2} \times 2$$

$$k = 5 \times 2$$

$$k = 10$$

\therefore equation is: $y = \frac{10}{x}$



7. Determine the equation of the given graph

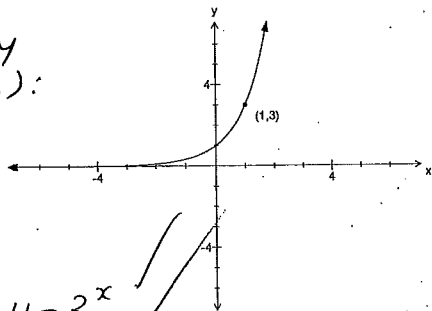
$$y = a^x$$

sub in point $(1, 3)$:

$$3 = a^1$$

$$a = 3$$

\therefore equation is: $y = 3^x$

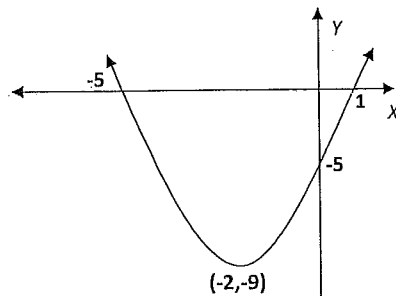


8.

Determine the equations of the parabolas below

Leave your answer in the form $y = ax^2 + bx + c$

i)



* positive (concave up)

$$y = a(x - \alpha)(x - \beta)$$

$$y = a(x - 5)(x - 1)$$

$$y = a(x + 5)(x - 1)$$

sub in point $(-2, -9)$:

$$-9 = a(-2 + 5)(-2 - 1)$$

$$-9 = a(3)(-3)$$

$$\frac{-9}{-9} = \frac{-9a}{-9}$$

$$\therefore a = 1$$

$$y = (x + 5)(x - 1)$$

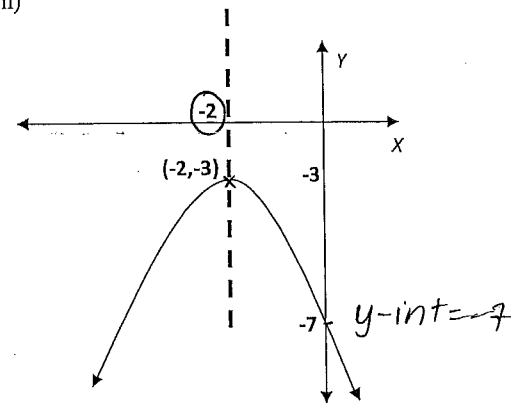
$$y = x(x - 1) + 5(x - 1)$$

$$y = x^2 - x + 5x - 5$$

$$\therefore y = x^2 + 4x - 5 \text{ is}$$

the equation

ii)



* concave down

y-int = -7, vertex = (-2, -3), axis of symmetry =

$$y = ax^2 + bx + c$$

sub in point $(-2, -3)$:

$$x = \frac{-b}{2a}$$

$$-2 = \frac{-b}{2a}$$

$$-2 \times 2a = -b$$

$$-4a = -b$$

$$\therefore b = 4a$$

sub in point $(-2, -3)$

$$y = ax^2 + bx - 7$$

$$-3 = a(-2)^2 + (4a \times -2) - 7$$

$$-3 + 7 = 4a - 8a$$

$$\frac{4}{-4} = \frac{-4a}{-4}$$

$$\therefore a = -1$$

$$\therefore y = -x^2 - 4x - 7$$

is the equation

$$\boxed{\begin{matrix} b = 4a \\ = 4(-1) \\ = -4 \end{matrix}}$$