Factoring,

# FOM 11 Practice in Partial Factoring & Find Equation of Parabola

$\boxed{1} \times \boxed{5} = 5$

$\boxed{1} + \boxed{5} = 6$

(1) Use Factoring to graph $y = +x^2 + 6x + 5$. Find

| $x$ | $x$ |
|---|---|
| 1 | 5 |

a) The factored form,

$(x + ?)(x + ?)$

$\boxed{(x+1)\ (x+5)}$

b) the x-intercepts $\boxed{x = -1 \text{ \& } x = -5}$

because $(x+1)(x+5) = 0$

means: $x+1=0$, $x=-1$ OR $x+5=0$, $x=-5$

c) the axis of symmetry

$x = \frac{-1 + -5}{2} = \frac{-6}{2} = -3$ $\boxed{x = -3}$

d) the vertex

Plug in $x = -3$: $y = (-3)^2 + 6(-3) + 5$

$y = 9 + -18 + 5 = -4$

$\boxed{\text{Vertex is } (-3, -4)}$

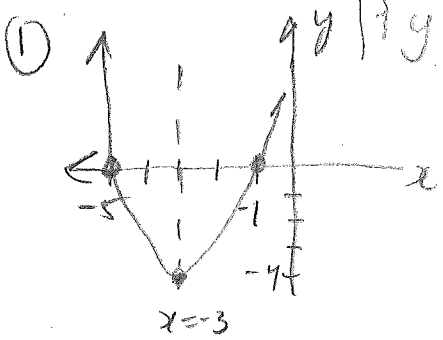
e) the domain

$\boxed{\{x \mid x \in \mathbb{R}\}}$

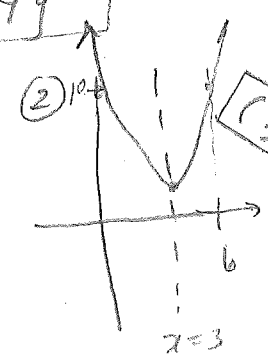
f) the range

$\boxed{\{y \mid y \geq -4\}}$

(1)




(2)




Vertex $\boxed{(3, 1)}$

(2) $y = \boxed{x^2 - 6x} + 10$ does not factor! Use partial factoring.

a) Rewrite the above but with the 1st 2 terms factored

$y = x(x-6) + 10$

$y = ?(\ \ ?\ \ ) + 10$

b) Set the factored part to 0. what $x(x-6) = 0$

so $\boxed{x=0}$ OR $x - 6 = 0$, $\boxed{x=6}$

x-values do you get $\boxed{x=0, x=6}$

c) What are the corresponding points? $\boxed{(0,10)\ (6,10)}$

d) the axis of symmetry?

$x = \frac{0+6}{2} = \frac{6}{2} = 3$ $\boxed{x=3}$

e) the vertex?

Plug in $x = 3 \Rightarrow y = 3^2 - 6(3) + 10$

$= 9 - 18 + 10$

$= 1$

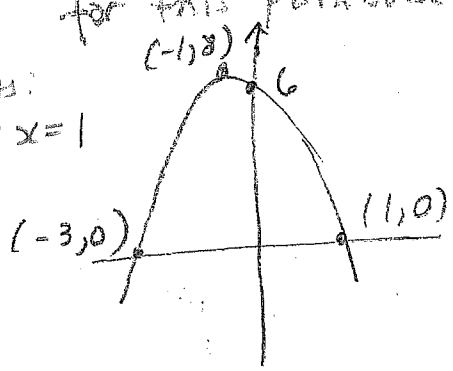
f) the domain?

$\boxed{\{x \mid x \in \mathbb{R}\}}$

g) the range?

$\{y \mid y \geq 1\}$

(3) Find the quadratic equation for this parabola.




Notice

- x-intercepts: $x = -3$ & $x = 1$
- y-int: $(0,6)$

use as x y

Hint: $y = a(x - r)(x - s)$

opposite of the x-intercepts

- Plug in a point $(x, y)$ & solve for a.

$y = a(x+3)(x-1)$

$6 = a(0+3)(0-1)$

$\frac{6}{-3} = \frac{a(-3)}{-3}$

$(a = -2)$ so $y = -2(x+3)(x-1)$

a

opp. of x-intercepts