

Fill in the chart

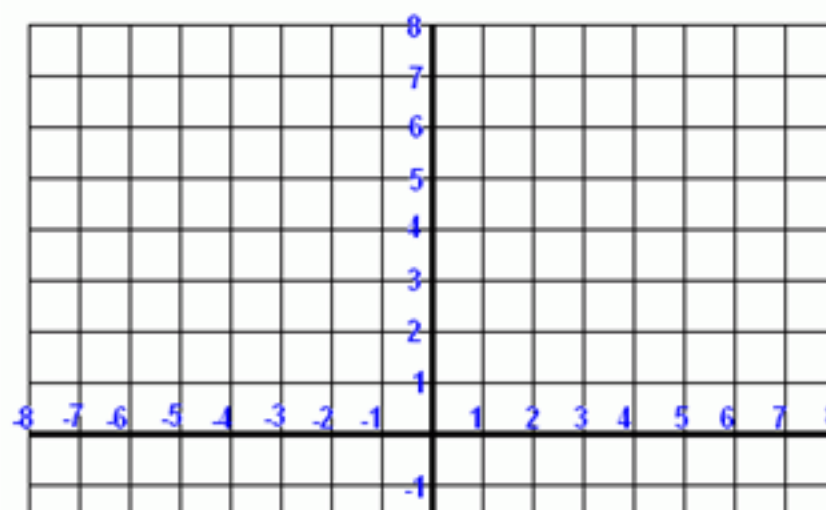
	$y = -2(x-1)^2 + 4$	$y = (x-3)^2$	$y = 3(x+4)^2 + 2$
stretch factor			
Open up or down			
Vertical shift			
Horizontal shift			
vertex			
Equation of the Axis of symmetry			
y-intercept			
Max/min value			

Factored Form of a Quadratic Relation

Make a table of values and then graph the following equation: $y = x^2 + 6x + 8$

Label ALL important points.

x	$y = x^2 + 6x + 8$	(x,y)
-2	$y = (-2)^2 + 6(-2) + 8 = 0$	(-2, 0)
-1	$y = (-1)^2 + 6(-1) + 8 = 3$	(-1, 3)
0		
1		
2		



hw

Fill in the chart

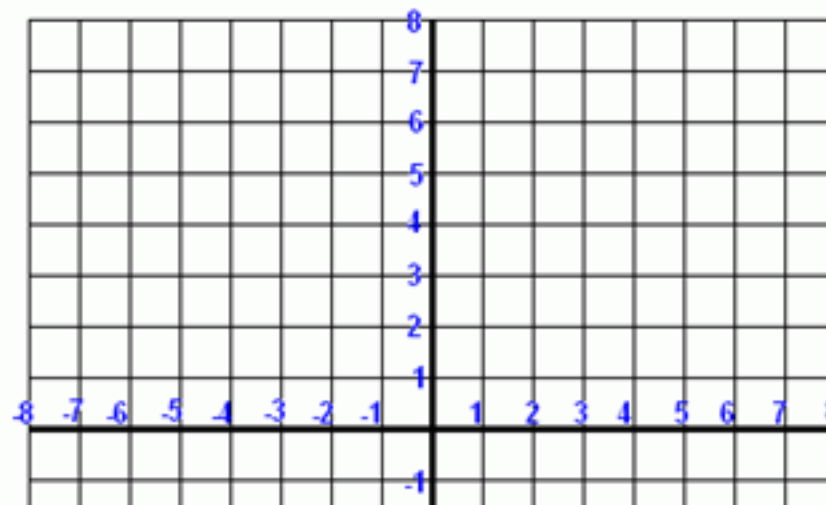
	$y = -2(x-1)^2 + 4$	$y = (x-3)^2$	$y = 3(x+4)^2 + 2$
stretch factor	think 2		
Open up or down	down		
Vertical shift	up 4		
Horizontal shift	right 1		
vertex	(1, 4)		
Equation of the Axis of symmetry	$x = 1$		
y-intercept			
Max/min value	max		

Factored Form of a Quadratic Relation

Make a table of values and then graph the following equation: $y = x^2 + 6x + 8$

Label ALL important points.

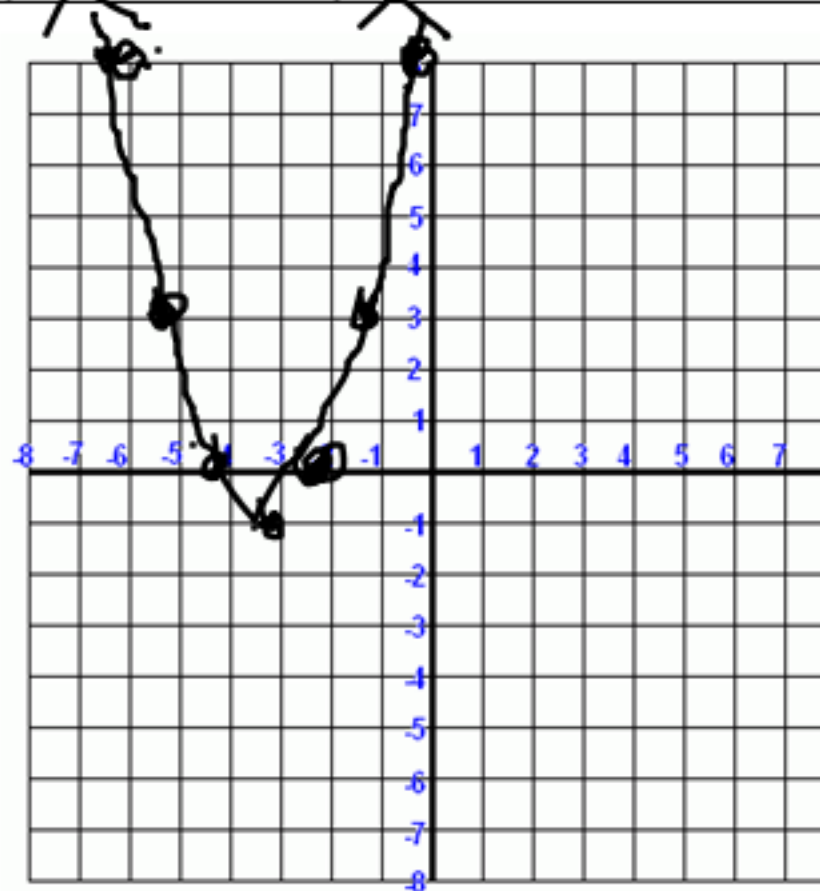
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1		
2		



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0	$y = (0)^2 + 6(0) + 8 = 8$	(0, 8)
*-3	$(-3)^2 + 6(-3) + 8 = -1$	(-3, -1)
*-4	$(-4)^2 + 6(-4) + 8 = 0$	(-4, 0)



$y = x^2 + 6x + 8$
 $y = (x+2)(x+4)$
 $x+2=0 \rightarrow x=-2$
 $x+4=0 \rightarrow x=-4$
 s.s. $\{-2, -4\}$

Handwritten notes on the right side of the graph:
 $(-5, 3)$
 $(-6, 8)$

Course: Grade 10 Mathematics

Factored form of a Quadratic Equation is

Factored form of a Quadratic Equation is

$$y = a(x - s)(x - t)$$

where s and t are the ~~zeros~~ zeros or x-intercepts and a is the stretch factor and direction of opening.

Zeros occur when $y = 0$.

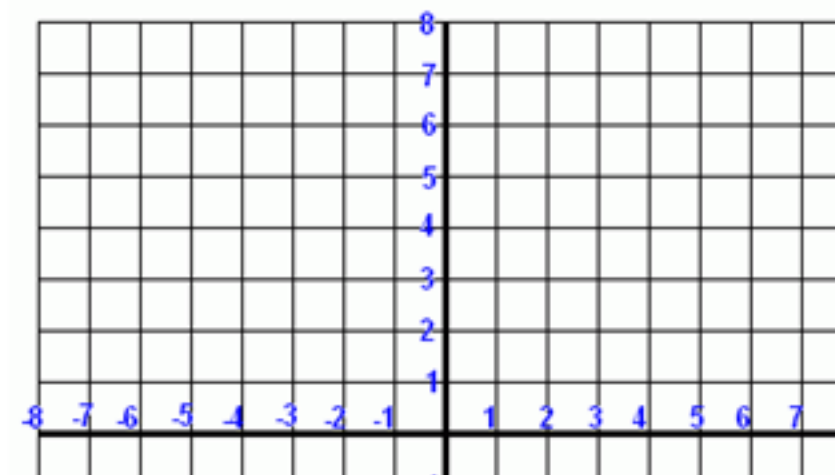
y-intercept occurs when $x = 0$

The **vertex** (*maximum/minimum*) can be found by plugging in the **x value** of the axis of symmetry and **solving for y**

1. For the following quadratic relation:

- Determine the **zeros** (aka the "solution set")
- Determine the **y-intercept** ($x = 0$)
- Determine the **axis of symmetry**
- Determine the coordinates of the **vertex**
- Sketch the graph

$$y = x^2 + 10x + 16$$



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1. For the following quadratic relation:
- Determine the **zeros** (aka the "solution set")
 - Determine the **y-intercept** ($x = 0$)
 - Determine the **axis of symmetry**
 - Determine the coordinates of the **vertex**
 - Sketch the graph

$$y = x^2 + 10x + 16$$

$$i) y = x^2 + 10x + 16$$

$$y = (x + 2)(x + 8)$$

$$x + 2 = 0 \quad x + 8 = 0$$

$$x = -2 \quad x = -8$$

zeros $\{-2, -8\}$

$$ii) y = x^2 + 10x + 16$$

$$y = 0^2 + 10(0) + 16$$

$$y = 16$$

$$iii) \text{ a.o.s } x = -5$$

$$\begin{array}{r} \textcircled{x} 16 \\ \textcircled{+} 10 \\ \hline 1 \quad 16 \\ \textcircled{2} \quad \textcircled{8} \\ \hline 4 \quad 16 \end{array}$$

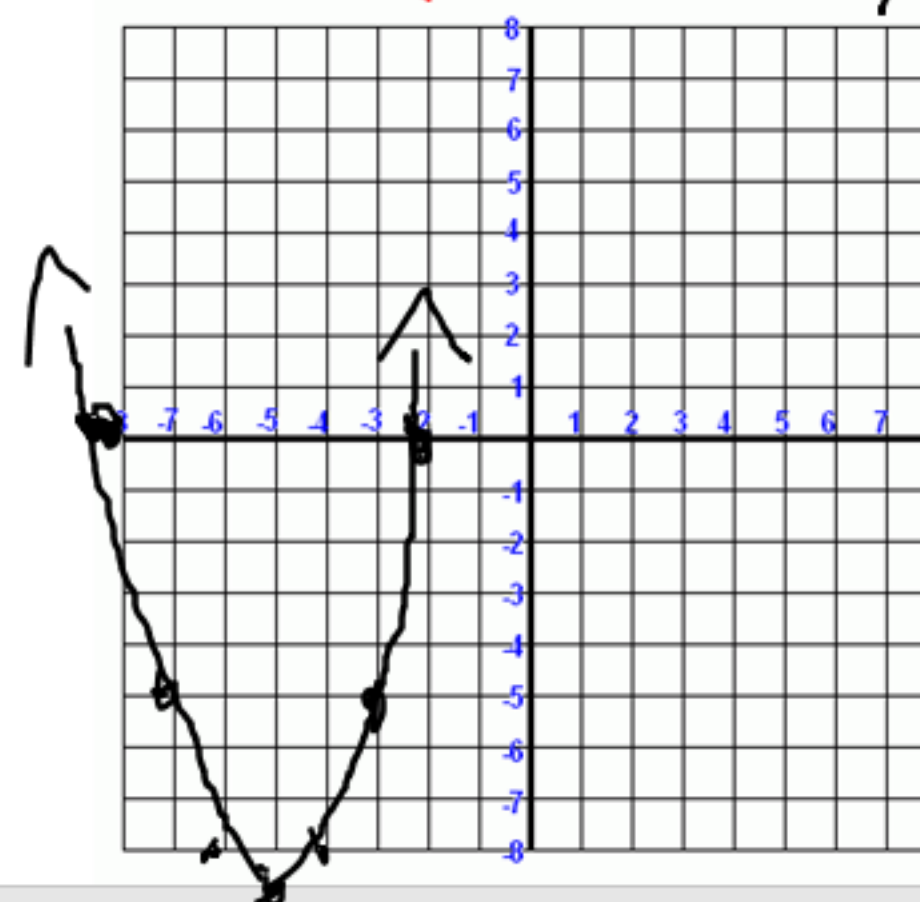
$$iv) y = x^2 + 10x + 16$$

$$y = (-5)^2 + 10(-5) + 16$$

$$y = 25 - 50 + 16$$

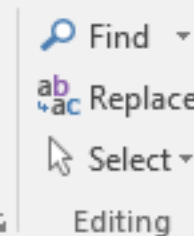
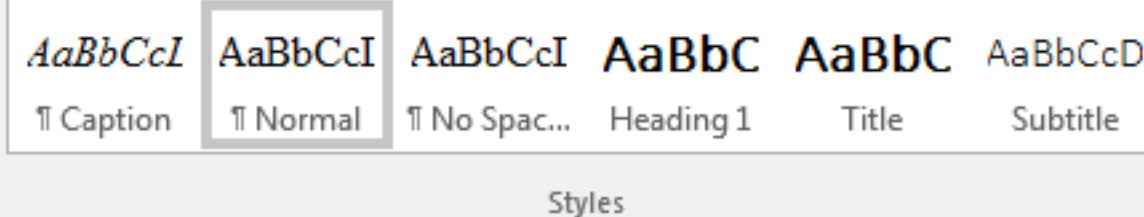
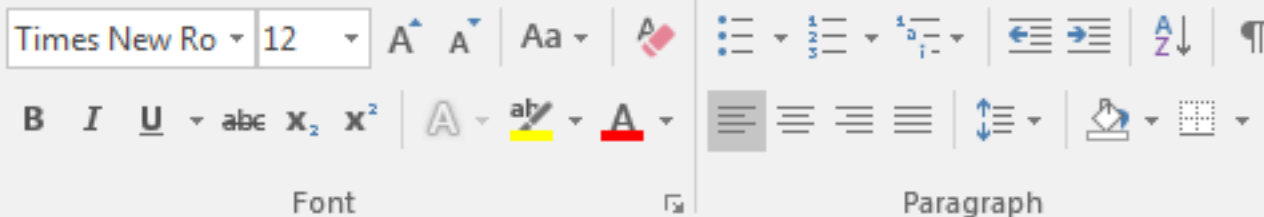
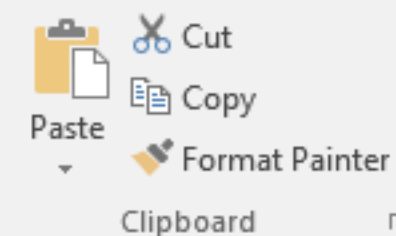
$$y = -9$$

Vertex $\rightarrow (-5, -9)$



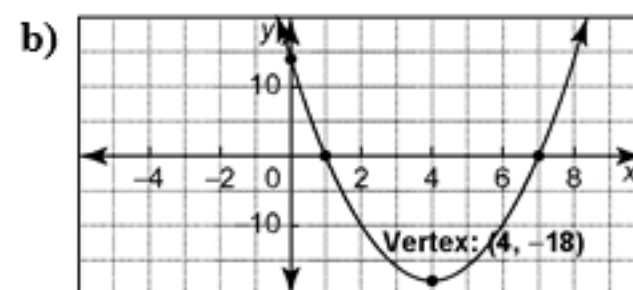
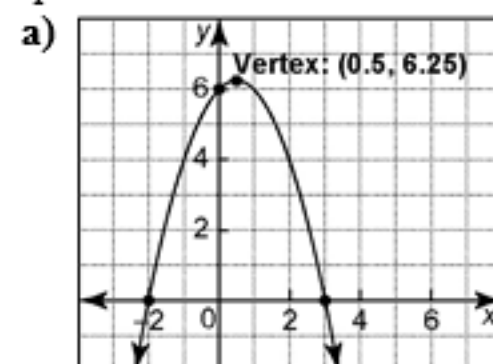
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Writing the Equation

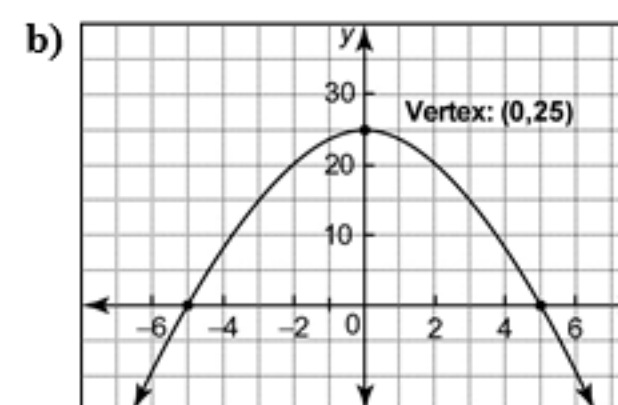
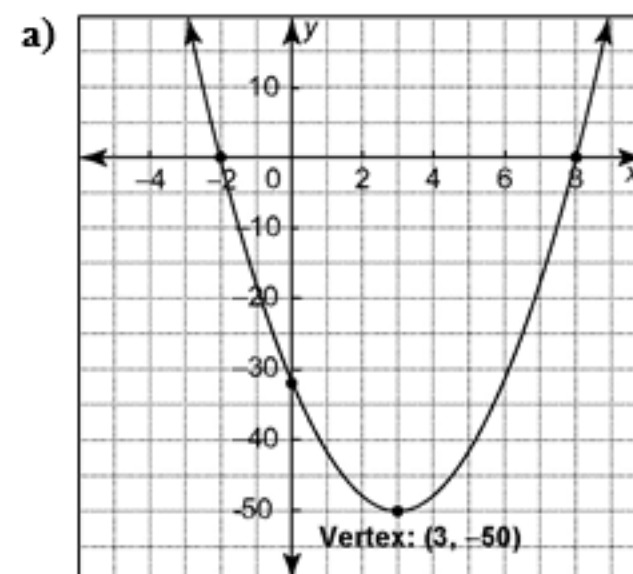


Section 5.5 The x-Intercepts of a Quadratic Relation

1. Find the x-intercepts of each quadratic relation.



2. Find the zeros of each quadratic relation.



3. Find the zeros of each quadratic relation.

- a) $y = (x - 1)(x + 2)$
 b) $y = 3(x + 7)(x - 5)$
 c) $y = -2x(x - 6)$
 d) $y = -(x + 6)(x - 9)$
 e) $y = 4(x + 8)(x - 2)$
 f) $y = 6(x - 6)(x + 6)$

4. Find the zeros by factoring. Check by graphing.

- a) $y = x^2 + 8x + 15$
 b) $y = x^2 - 2x - 8$
 c) $y = 2x^2 - 18$
 d) $y = 3x^2 - 12x - 36$
 e) $y = -x^2 + 4x + 5$
 f) $y = 6x^2 - 24$

5. Find the zeros by factoring.

- a) $y = 0.5x^2 + 2x - 6$
 b) $y = 1.5x^2 - 9x - 24$

6. Which relation has more than one x-intercept? How do you know?

- a) $y = -3(x + 2)^2 + 1$
 b) $y = 2(x + 5)^2 + 2$

{ -2, 3 }

{ 1, -2 }

