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Fill in the chart

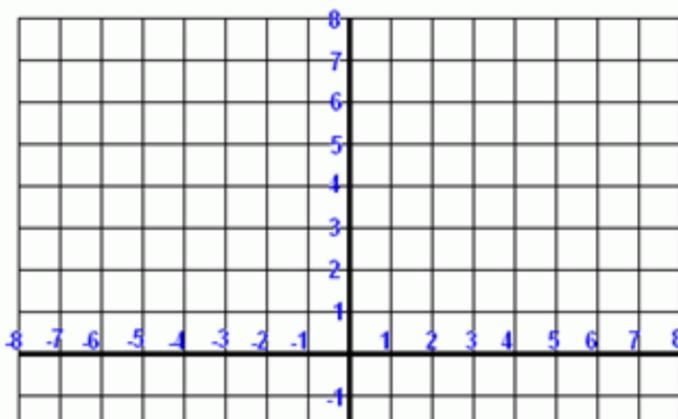
	$y = -2(x-1)^2 + 4$	$y = (x-3)^2$	$y = 3(x+4)^2 + 2$
stretch factor			
Open up or down			
Vertical shift			
Horizontal shift			
vertex			
Equation of the Axis of symmetry			
y-intercept			
Max/min value			

### 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		



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hw

Fill in the chart

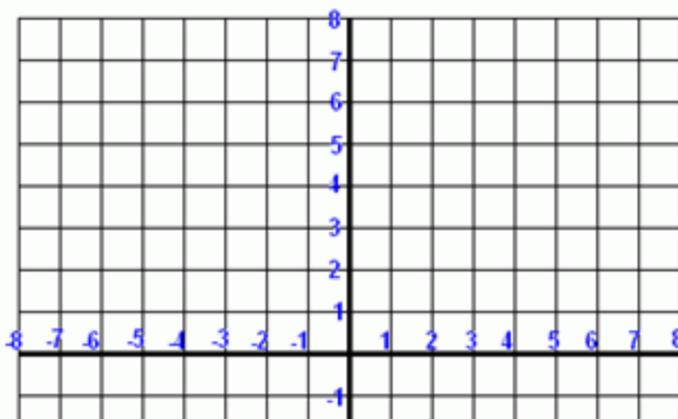
	$y = -2(x-1)^2 + 4$	$y = (x-3)^2$	$y = 3(x+4)^2 + 2$
stretch factor	shrink 2		
Open up or down	down		
Vertical shift	up 4		
Horizontal shift	right 1		
vertex	(1, 4)		
Equation of the Axis of symmetry	$x = 1$		
y-intercept			
Max/min value	max		

### 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.

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		



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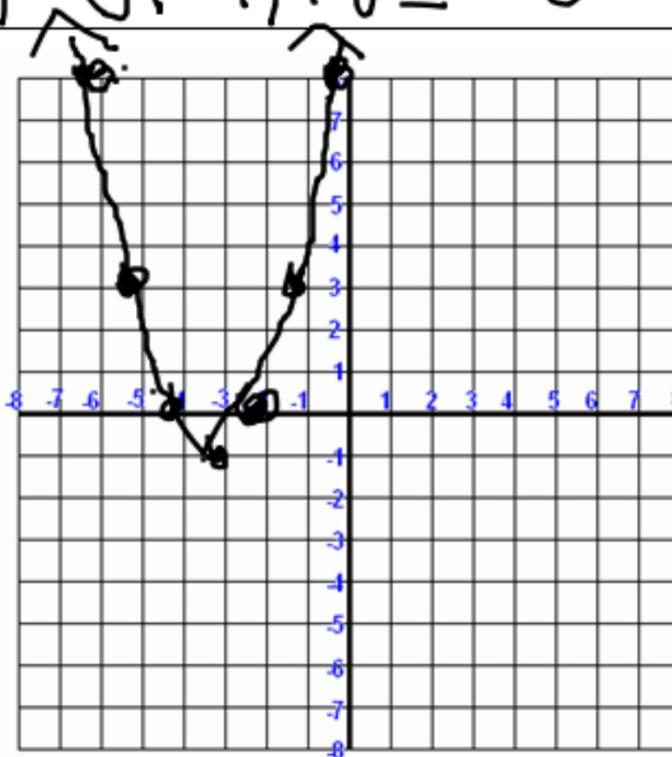
### Factored Form of a Quadratic Relation

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	$y = (0)^2 + 6(0) + 8 = 8$	(0, 8)
$x = -3$	$(-3)^2 + 6(-3) + 8 = -1$	(-3, -1)
$x = -4$	$(-4)^2 + 6(-4) + 8 = 0$	(-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.  $\{-2, -4\}$

$\begin{matrix} 0 & 8 \\ -1 & 6 \\ 2 & 4 \end{matrix}$



$(-5, 3)$   
 $(-6, 8)$

Factored form of a Quadratic Equation is

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Factored form of a Quadratic Equation is

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

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

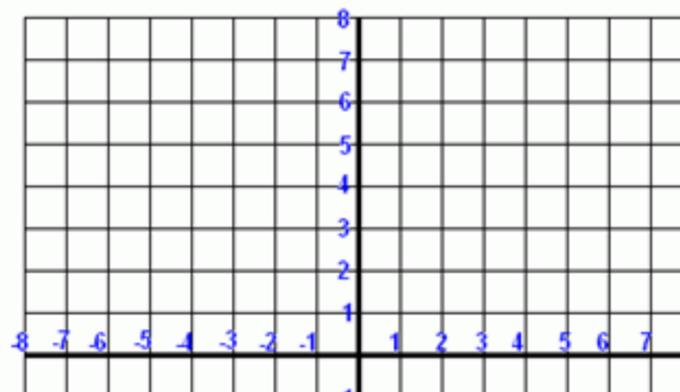
**Zeros** occur when  $y = 0$ .  
**y-intercept** occurs when  $x = 0$

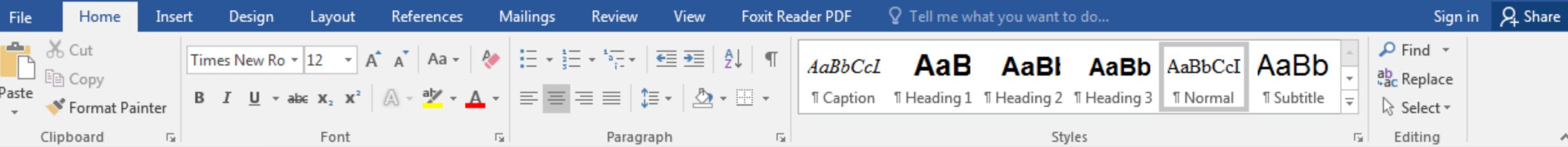
*roots*

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

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





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

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

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

$x+2=0 \rightarrow x=-2$

$x+8=0 \rightarrow x=-8$

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

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

x	16
+	10
-----	
	2, 8

u, n

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

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

$y = 16$

iii) a.o.s  $x = -5$

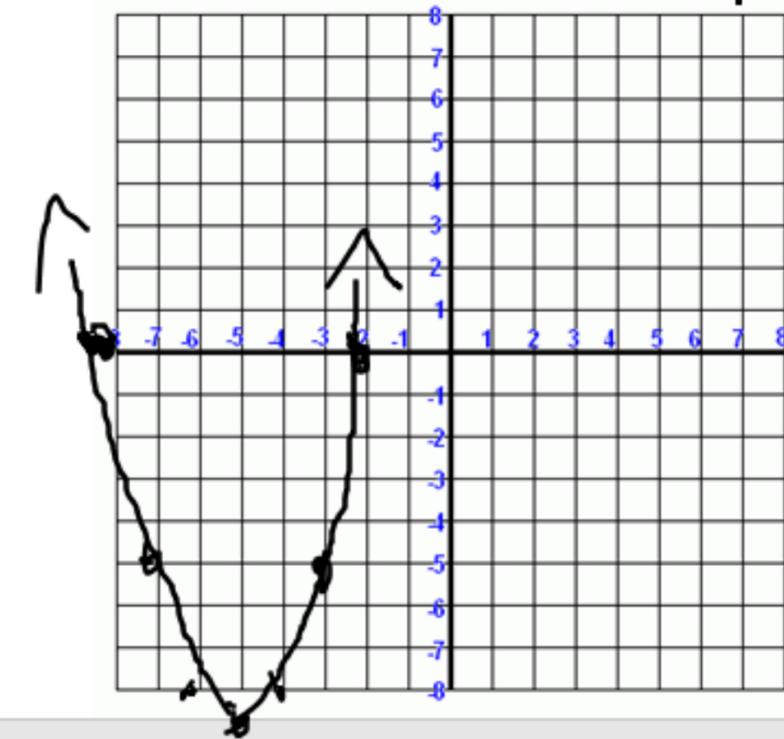
iv)  $y = x^2 + 10x + 16$

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

$y = 25 - 50 + 16$

$y = -9$

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



Course: Grade 10 Mathematics

**Writing the Equation**

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Times New Roman 12 A A Aa A

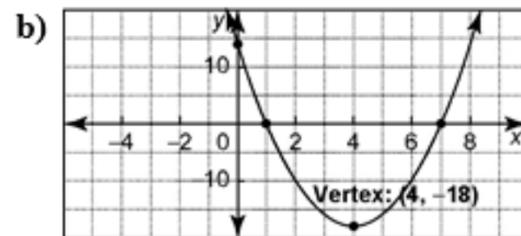
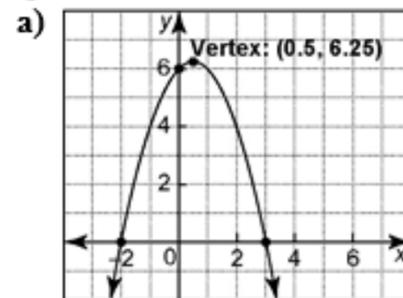
B I U abc x<sub>2</sub> x<sup>2</sup> A a

Paragraph Styles

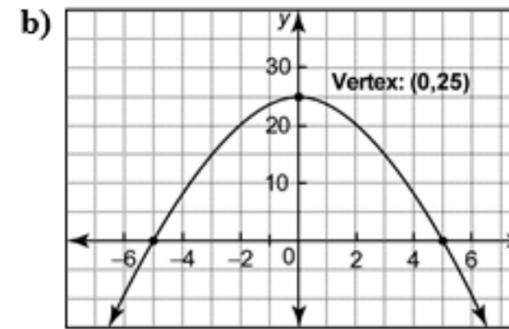
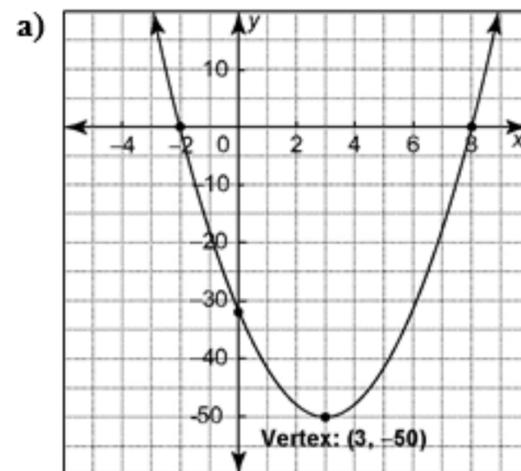
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## Section 5.5 The x-Intercepts of a Quadratic Relation

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)  $y = 2(x + 5)^2 + 2$

*Handwritten:* { -2, 3 }

*Handwritten:* { 1, -2 }

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