Topic (2) : Polynomials and Factoring

Book Pages : 47-

- **Lesson(1):adding and subtracting polynomials.**
  Focus on the degree of the polynomials, the number of terms(mono, bi, tri, tetra…) and how to write the polynomial in the standard form.
- **Lesson(2): multiplying polynomials**
- **Lesson (3): Multiplying special cases**
  Focus on the factoring of square of binomials pages 63 and 64

$$a^2 + 2ac + c^2 = (a + c)(a + c) = (a + c)^2$$

$$a^2 - 2ac + c^2 = (a - c)(a - c) = (a - c)^2$$

- **Lesson (4): Factoring polynomials.**
  Focus on the greatest common factor (GCF)
- **Lesson (5,6 and 7): factoring $ax^2 + bx + c$**
  (use your notes for these lessons)
  Factor the 3 cases: 1) when b=0, use square root

Solve Quadratic Equations by Square Root

$$x^2 - 36 = 0$$

Step One: Isolate x^2

$$x^2 = 36$$

Step Two: Square root both sides

$$\sqrt{x^2} = \pm\sqrt{36}$$

Step Three: Simplify

$$x = \pm 6$$

2) when c=0, take common factor:

$x^2 - 8x = 0$	$2x^2 - 4x = 0$
$(x)(x - 8) = 0$	$2x(x - 2) = 0$
$x = 0$ or $x - 8 = 0$	$2x = 0$ or $x - 2 = 0$
$x = 0$ or $x = 8$	$x = 0/2$ or $x = 2$
	$x = 0$ or $x = 2$

3) when a,b and c all exist:

by factoring or **general quadratic formula.**

$$x^2 - 3x - 10 = 0$$

$$(x + 2)(x - 5) = 0 \quad \text{Factor.}$$

↙ ↘

$$x + 2 = 0 \qquad x - 5 = 0$$

$$x = -2 \qquad x = 5$$

Solve Using the Quadratic Formula:

$x^2+12x+32=0$

$a=1 \quad b=12 \quad c=32$

$$= \frac{-12+4}{2} \quad = \frac{-12-4}{2}$$

$x=-4 \qquad x=-8$

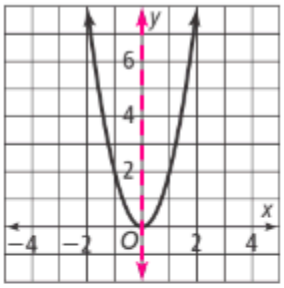
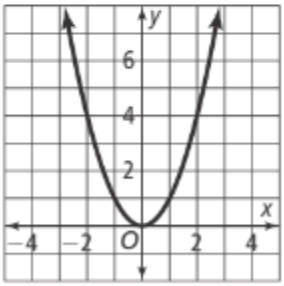
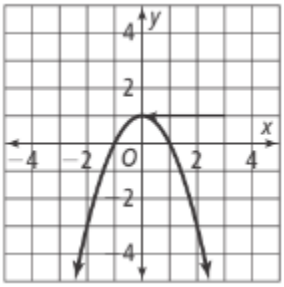
$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-12 \pm \sqrt{(12)^2-4(1)(32)}}{2(1)}$$

$$= \frac{-12 \pm \sqrt{144-128}}{2} = \frac{-12 \pm \sqrt{16}}{2} = \frac{-12 \pm 4}{2}$$

Topic (3): Quadratic functions

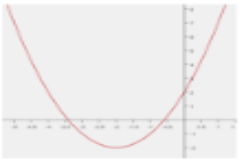
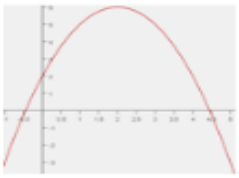
- **Lesson (1): key features of quadratic function**

3-1 Mathematical Literacy and Vocabulary:

Word or Phrase	Definition	Picture or Example
axis of symmetry	The line that divides the parabola into two matching halves	1. 
parabola	2. The graph of a quadratic function	
quadratic parent function	The simplest function of the quadratic function family	3. $f(x) = x^2$
vertex	5. the lowest or highest point on the graph of a quadratic function	

- **Lesson (2): Quadratic function in Vertex form**
- **Lesson (3): Quadratic function in standard form**

Solve practice questions in each lesson and use the table below to review main concepts.

feature	Vertex form	Standard form
General formula	$F(x) = a(x-h)^2 + k$	$F(x)= ax^2 + bx + c$
Vertex	(h,k)	**x=** $\frac{-b}{2a}$, **y =** F(x), plug x value in the function
Axis of symmetry	X = h	X = $\frac{-b}{2a}$
Y intercept	Plug x=0 in the function, then find the value of y.	Plug x=0 in the function, then find the value of y. *** it is usually c y-intercept= (0,c)
Direction	If **a** is positive : upwards  Opens up if $a > 0$	If **a** is negative : downwards  Opens down if $a < 0$
Stretched / compressed	**Stretched (wide)** when (a) is a fraction,(ex: 0.5, -0.7, $\frac{1}{2}$…)	**compressed(narrow)** when (a) is a whole number,(ex: -2, -1.75, 3.6 , 4 , …)
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