Unit 2: Quadratic Functions Lesson 2.2

Coach's Corner – II

1. Use the *Quadratic Function* applet from *Lesson 2.2* to answer this question. You won't be able to enter the exact function into the applet, but you can use patterns seen there to guide you. For the function $f(x) = -2x^2 + 4x - 9$:

   a. Explain what happens if a is changed to 0.

   b. How does the graph of the function change if a is 2 instead of –2?

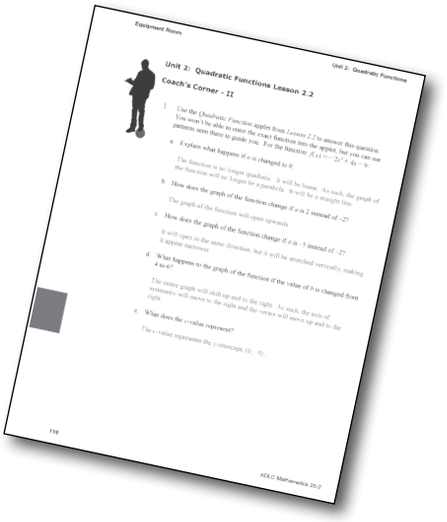
   c. How does the graph of the function change if a is –5 instead of –2?

   d. What happens to the graph of the function if the value of b is changed from 4 to 6?

   e. What does the c-value represent?

Please go to the *Equipment Room* to check your solutions before returning to *Lesson 2.2*.

After you have assessed your work, reflect upon your understanding of the concepts addressed in the *Coach's Corner* exercises in the table provided.


Equipment Room

Unit 2: Quadratic Functions

Unit 2: Quadratic Functions Lesson 2.2

Coach's Corner - 11

1. Use the *Quadratic Function* applet from *Lesson 2.2* to answer this question. You won't be able to enter the exact function into the applet, but you can see patterns seen there to guide you. For the function $f(x) = -2x^2 + 4x - 9$:

a. Explain what happens if a is changed to 0.

The function is no longer quadratic. It will be linear. As such, the graph of the function will no longer be a parabola. It will be a straight line.

b. How does the graph of the function change if a is 2 instead of -2?

The graph of the function will open upwards.

c. How does the graph of the function change if a is -5 instead of -2?

It will open in the same direction, but it will be stretched vertically, making it appear narrower.

d. What happens to the graph of the function if the value of b is changed from 4 to 6?

The entire graph will shift up and to the right. As such, the axis of symmetry will move to the right and the vertex will move up and to the right.

e. What does the c-value represent?

The c-value represents the y-intercept, $(0, -9)$.

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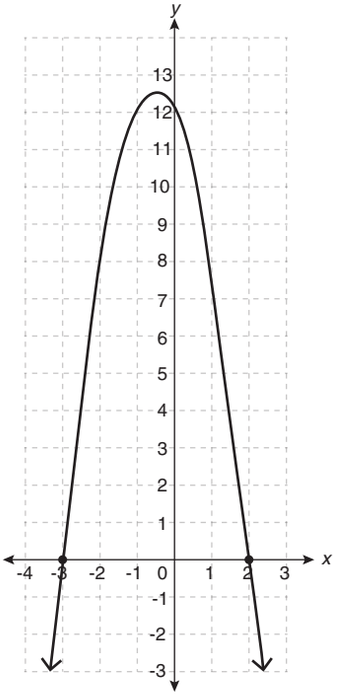
Question Number	Got it!	Almost there…	Need to retry or ask for help.
1			

Unit 2: Quadratic Functions Lesson 2.2

Coach's Corner – III

Use the following graph to answer question 1:



1. a. Express the function in factored form as $f(x) = a(x - r)(x - s)$, given the graph and the fact that the GCF is $a = -2$.

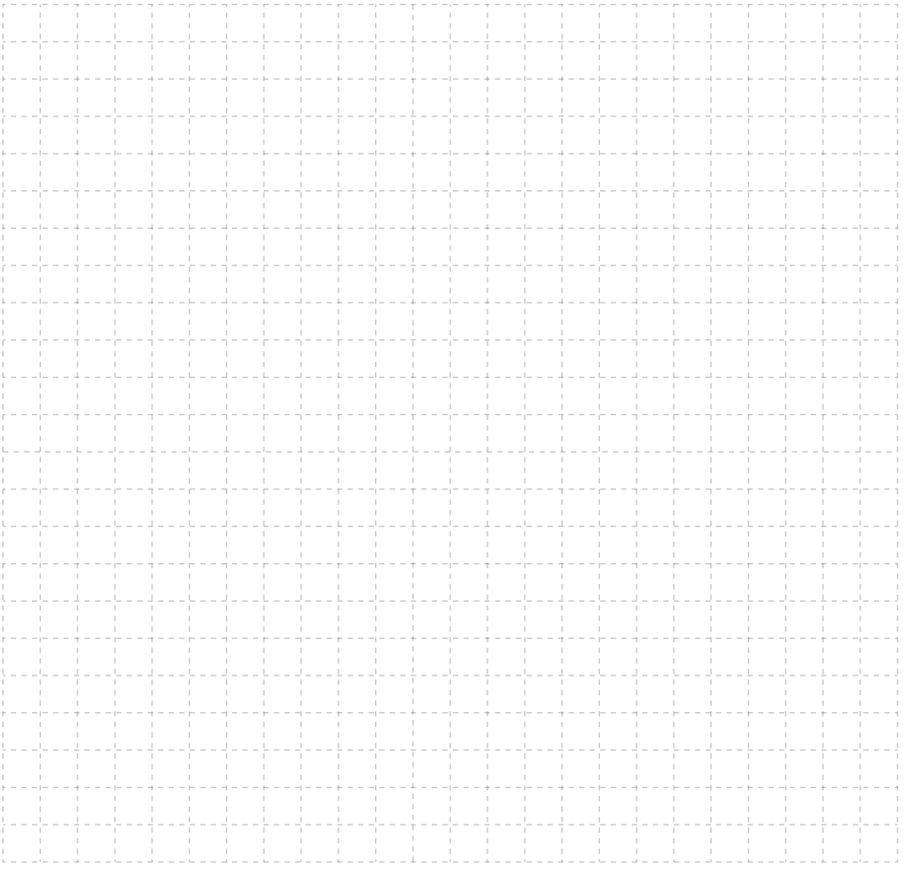
b. Determine the y-intercept.

c. Express the equation of the function in standard form.

2. Consider the function $f(x) = 2x^2 - 3x - 9$.

a. Express the function in factored form.

b. Use the factored form to sketch the graph of the function.

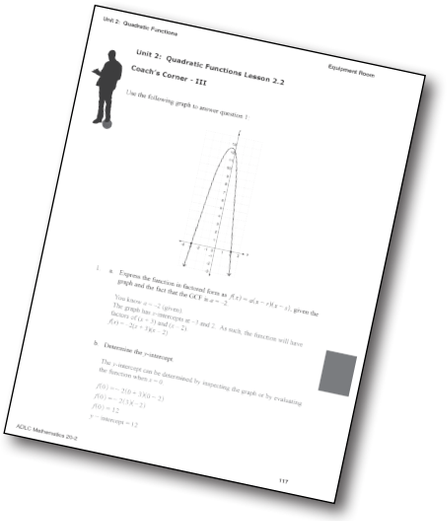


3. Complete the following table for the graph of $f(x) = -4(x-3)^2 + 7$ without actually graphing it.

y-intercept	
axis of symmetry	
vertex	
domain	
range	

Please go to the *Equipment Room* to check your solutions before returning to *Lesson 2.2*

After you have assessed your work, reflect upon your understanding of the concepts addressed in the *Coach's Corner* exercises in the table provided.


Unit 2: Quadratic Functions

Unit 2: Quadratic Functions Lesson 2.2

Equipment Room

Coach's Corner - III

Use the following graph to answer question 1

1. a. Express the function in factored form as $f(x) = a(x - r)(x - s)$, given the graph and the fact that the GCF is $a = 2$.

Your factors of -2 (given)

The graph has x-intercepts at -3 and 2. As such, the function will have factors of $(x + 3)$ and $(x - 2)$.

$f(x) = 2(x + 3)(x - 2)$

b. Determine the y-intercept

The y-intercept can be determined by inspecting the graph or by evaluating the function when $x = 0$.

$f(0) = 2(0 + 3)(0 - 2)$

$f(0) = 2(3)(-2)$

$f(0) = 12$

y - intercept = 12

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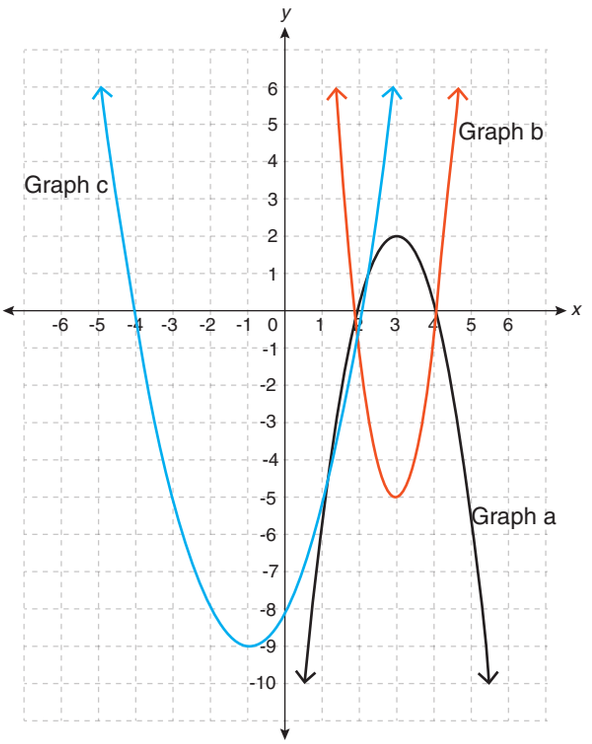
Question Number	Got it!	Almost there…	Need to retry or ask for help.
1			
2			
3			

Unit 2: Quadratic Functions Lesson 2.2

Coach's Corner – IV

1. Three quadratic functions are listed below. Complete the chart by writing the letter to the matching function.

Function	Graph
$f(x) = 3(x-3)^2 - 5$	
$g(x) = x^2 + 2x - 8$	
$h(x) = -2(x-2)(x-4)$	



2. For each function from question 1, list two characteristics you used to correctly match it to its graph.

   a. $f(x) = 3(x-3)^2 - 5$

   b. $g(x) = x^2 + 2x - 8$

   c. $h(x) = -2(x-2)(x-4)$

3. Convert the function $h(x) = -2(x-2)(x-4)$ to standard form by expanding.

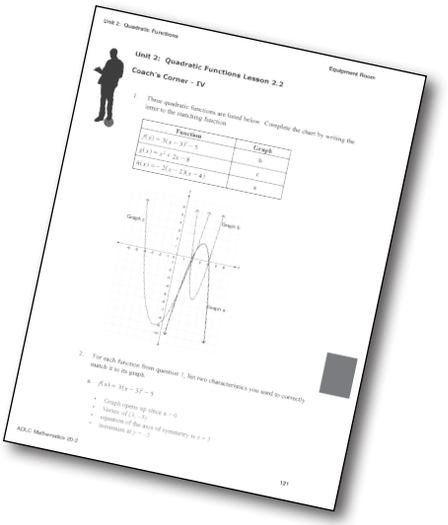
4. a. Research the track and field sport of high-jumping on the Internet or You Tube. Describe in several sentences how the athlete maneuvers successfully over the high-jump bar.

b. Assume that the shape of the athlete's high-jump is parabolic. Determine the equation of the function, in vertex form, where $h(t)$ is the height of the jump in metres and t is the time that the jump takes in seconds.

- Starting lift off point of athlete (0,0)
- Maximum height is 1.80 metres
- Landing on a crash pad that is 0.75 metres thick.
- Equation of the axis of symmetry is $t = 0.6$.

Please go to the *Equipment Room* to check your solutions before proceeding to *Game On!*, on the next page of this *Workbook*..

After you have assessed your work, reflect upon your understanding of the concepts addressed in the *Coach's Corner* exercises in the table provided.


Unit 2: Quadratic Functions

Equipment Room

Unit 2: Quadratic Functions Lesson 2.2

Coach's Corner - IV

1. Three quadratic functions are listed below. Complete the chart by writing the letter to the matching function.

Function	Graph
$f(x) = 3(x-3)^2 - 5$	b
$g(x) = x^2 + 2x - 8$	c
$h(x) = -2(x-2)(x-4)$	a

Graph a

Graph b

Graph c

2. For each function from question 1, list two characteristics you used to correctly match it to its graph.

a. $f(x) = 3(x-3)^2 - 5$

- Graph opens up since $a > 0$
- Values of $f(-5)$
- equation of the axis of symmetry is $x = 3$
- minimum at $y = -5$

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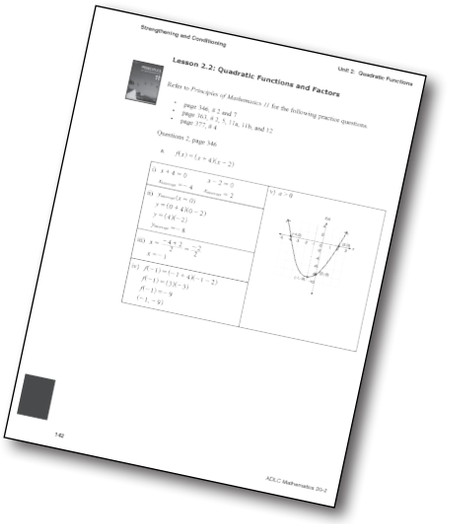
Question Number	Got it!	Almost there…	Need to retry or ask for help.
1			
2			
3			
4			

Note: Before you complete *Game On!*, you may review your skills and get more practice by completing the following problems in *Principles of Mathematics 11*.

- Page 346, #2 and 7
- Page 363, #2, 5, 11a, 11b, and 12
- Page 377, #4

Check your work in *Strengthening and Conditioning*.


Strengthening and Conditioning

Unit 2: Quadratic Functions

Lesson 2.2: Quadratic Functions and Factors

Refer to *Principles of Mathematics 11* for the following practice questions.

- page 346, #2 and 7
- page 363, #2, 5, 11a, 11b, and 12
- page 377, #4

Questions 2, page 346

a. $f(x) = 3(x+4)(x-2)$

i) $x + 4 = 0$ $x - 2 = 0$

x-intercept $= -4$ x-intercept $= 2$

ii) Point(s) of $x = 0$

$y = (0+4)(0-2)$

$y = (4)(-2)$

y-intercept $= -8$

iii) $x = \frac{-4+2}{2} = \frac{-2}{2}$

$x = -1$

iv) $f(-1) = (-1+4)(-1-2)$

$f(-1) = (3)(-3)$

$f(-1) = -9$

$(-1, -9)$

v) $x = 0$

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