Unit 2: Quadratic Functions Lesson 2.2

Game On!

(3) 1. Explain how parameters a, b, and c from the standard form of a quadratic function can be interpreted.

$y = ax^2 + bx + c$

a:

b:

c:

(2) 2. Identify the information about the graph of a quadratic function that can readily be determined from the factored form. Explain how this information is determined.

(3) 3. Explain how parameters a, h, and k from the vertex form of a quadratic function can be interpreted.

$y = a(x - h)^2 + k$

a:

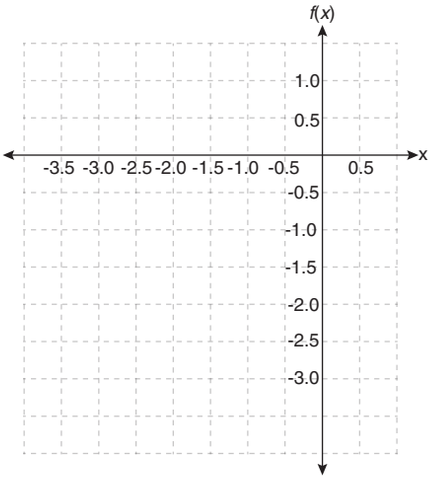
(h,k):

$x = h$:

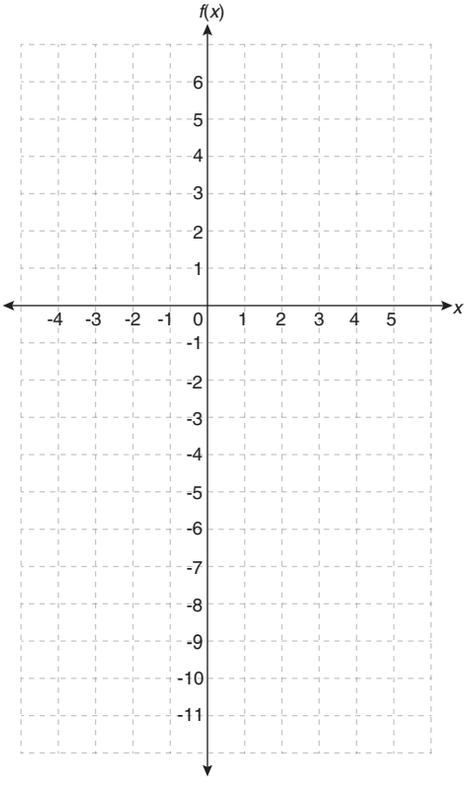
$y = k$

4. Sketch the graph of each of the following quadratic functions without using technology. Be sure to explain the steps you take.

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



(4) b. $f(x) = 3(x-2)^2 - 10$



(3) c. State the domain and range for the functions in parts a and b.

a. Domain:
Range:

b. Domain:
Range:

(3) 5. A quadratic function has a vertex of (3,–6) and the point (–1,10) lies on the graph of the function. Write the function in standard form.

(3) 6. Convert the function $g(x) = 2x^2 + 6x - 20$ to factored form and determine the x-intercepts.

7. Larry likes skeet shooting, where a clay disc is shot into the air and the participant tries to shoot it as it flies through the air. The discs are released from a firing mechanism that sits at ground level and shoots the disc on average a horizontal distance of 120 m on a parabolic path. The average maximum height a disc reaches is 40 m.

(2) a. Sketch and label a diagram that represents the given information.

(2) b. Determine the equation of a function that represents the flight of the clay disc.

(1) c. Determine the domain and range of the quadratic function within the context provided.

Domain:

Range:

(3) 8. Determine the quadratic function, $f(x)$, with x-intercepts at $x = 7$ and $x = -2$ and y-intercept at $y = 5$.

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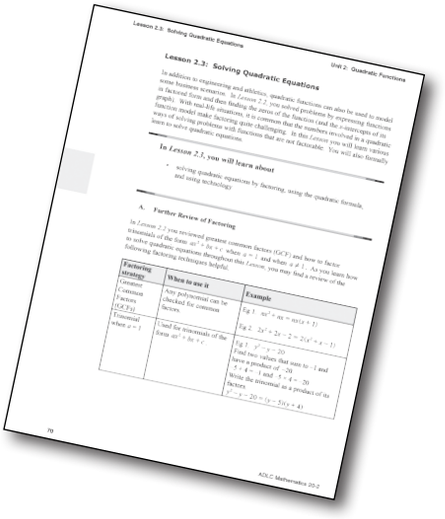
You have completed *Lesson 2.2 Game On!* Please review all work in *Workbook 2A* to ensure it is your best work. Submit *Workbook 2A* for marking at this time and proceed to *Lesson 2.3* in the *Module*.



Lesson 2.3: Solving Quadratic Equations

Unit 2: Quadratic Functions

Lesson 2.3: Solving Quadratic Equations

In addition to engineering and athletics, quadratic functions can also be used to model some business scenarios. In *Lesson 2.2*, you solved problems by expressing functions in factored form and then finding the zeros of the function (and the x-intercepts of its graph). With real-life situations, it is common that the numbers involved in a quadratic function model make factoring quite challenging. In this *Lesson* you will learn various ways of solving problems with functions that are not factorable. You will also formally learn to solve quadratic equations.

In *Lesson 2.3*, you will learn about

- solving quadratic equations by factoring, using the quadratic formula, and using technology.

A. Further Review of Factoring

In *Lesson 2.2* you reviewed greatest common factors (GCF) and how to factor trinomials of the form $ax^2 + bx + c$, where $a = 1$, and when $a \neq 1$. As you learn how to solve quadratic equations throughout this *Lesson*, you may find a review of the following factoring techniques helpful.

Factoring Strategy	When to use it	Example
Common factors (GCF)	Any polynomial can be checked for common factors.	Eg 1 $-4x^2 + 4x = 4x(x + 1)$
Trinomial where $a = 1$	Used for trinomials of the form $ax^2 + bx + c$	Eg 2 $2x^2 + 2x - 2 = 2(x^2 + x - 1)$
		Eg 3 $x^2 - x - 20$ Find two values that sum to -1 and have a product of -20. $4 + -5 = -1$ and $-5 \times 4 = -20$ Write the trinomial as a product of its factors. $x^2 - x - 20 = (x - 5)(x + 4)$

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End Of Workbook 2A