Name: _____ Date: _____

BLM 4–9

Chapter 4 Test

Multiple Choice

For #1 to 5, choose the best answer.

1. Consider the quadratic function $f(x) = 2x^2 - 8x - 5$. The smallest zero of the function is

A –0.55 **B** –5.00

C 2.00 **D** 4.55

2. The roots of the quadratic equation $6x^2 - 16x = 0$ are

A 0 **B** 0 or $\frac{8}{3}$

C 2 or $\frac{8}{3}$ **D** $\sqrt{\frac{8}{3}}$

3. For what value of k does the equation $(2k - 1)x^2 - 8x + 2 = 0$ have two equal real roots?

A $\frac{1}{2}$ **B** $\frac{29}{2}$ **C** $\frac{7}{2}$ **D** $\frac{9}{2}$

4. Which student uses correct mathematical vocabulary to describe the solutions to a quadratic equation?

A Alain: The solutions are the roots of the quadratic function.

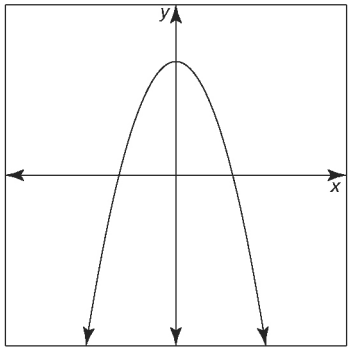
B Beth: The solutions are the zeros of the quadratic function.

C Cody: The solutions are the x-intercepts of the quadratic equation.

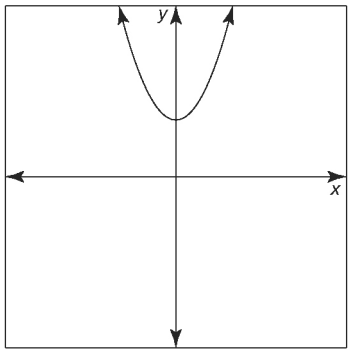
D Dolores: The solutions are the y-intercepts of the graph of the related function.

5. Which graph represents a quadratic function that has two distinct real roots?

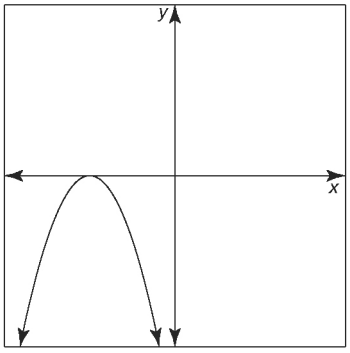
A



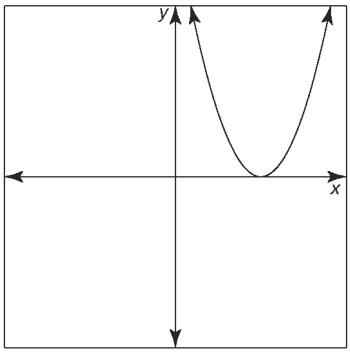
B



C



D



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Short Answer

6. A smokejumper is a firefighter who parachutes into remote areas to combat forest fires. Saskatchewan's smokejumpers, founded in 1949, were Canada's first aerial firefighting team. The function $h(t) = -16t^2 + 1500$ models the height, h, of a smokejumper, in feet, t seconds after jumping from 1500 ft. Suppose a parachute opens at 1000 ft. Determine algebraically how long the jumper was in free fall, to the nearest hundredth of a second.

7. Identify and correct the errors in each solution to the quadratic equations.

a) $2x^2 - 4x - 3 = 0$

$$x = \frac{-(-4) \pm \sqrt{-4^2 - 4(2)(-3)}}{2(2)}$$

$$x = \frac{4 \pm \sqrt{-16 + 24}}{4}$$

$$x = \frac{4 \pm \sqrt{8}}{4}$$

$$x = \frac{2 \pm \sqrt{2}}{2}$$

b) $15x^2 + 6x - 2 = 0$

$$15x^2 + 6x = 2$$

$$15x^2 + 6x + 9 = 2$$

$$(15x + 3)^2 = 2$$

$$15x + 3 = \sqrt{2}$$

$$x = \frac{\sqrt{2} - 3}{15}$$

8. Determine the real roots of each equation algebraically. Choose a different method for each equation, and explain why you chose that method. Express your answers as exact values in simplest form.

a) $x^2 - 10x + 16 = 0$

b) $3x^2 + 19x - 14 = 0$

c) $x^2 - 6x + 7 = 0$

d) $2(x - 3)^2 - 8 = 0$

9. Rewrite the equation $\frac{x+1}{x-5} + \frac{x-2}{x} = \frac{3x-1}{x-5}$ as a simplified quadratic equation equal to zero. Then, use the quadratic formula to determine the real roots of the equation.

10. For what values of k does the graph of $f(x) = kx^2 - 5x + k$ have no x-intercepts?

Extended Response

11. The length and width of a rectangle are 7 m and 5 m, respectively. When each dimension is increased by the same amount, the area is tripled. Find the dimensions of the new rectangle, to the nearest tenth of a metre.

12. Find a rational number such that the sum of the number and its reciprocal is $\frac{13}{6}$.

13. Robin Chestnut is a two-time Canadian juggling champion. As part of his act, Robin tosses a ball into the air and lets it drop to the floor. After a ball is tossed, its height, h, in metres, after t seconds, is modelled by the equation $h(t) = -4.9t^2 + 12t + 1.5$. For how many seconds, to the nearest hundredth, is the ball in the air?