

Holy Spirit High School
 Math 2201 Chapter 7 Quadratic Equations SAMPLE Test

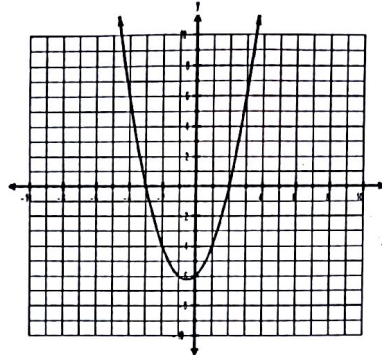
Part 1: Multiple Choice (10 marks)
 Identify the choice that best completes the statement or answers the question.

| Formula Provided |
|--|
| $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ |

1. What are the zero(s) of the quadratic function graphed below?

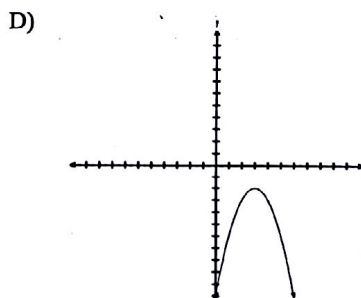
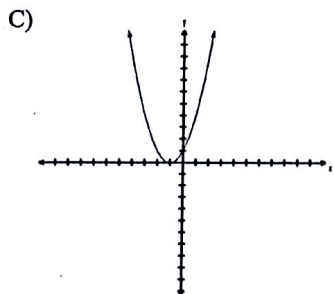
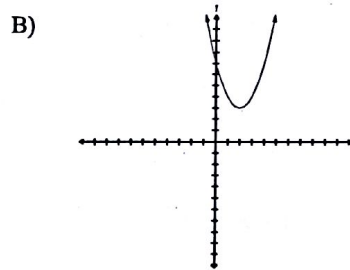
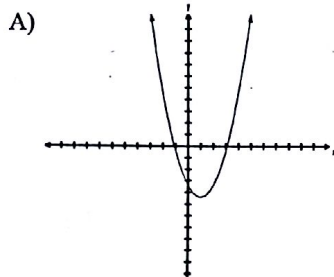
1. B

- A) -6
- B) -3 and 2
- C) 0 and 6
- D) 3 and -2



2. Which graph represents a quadratic equation with roots $1 \pm \sqrt{5}$?

2. A



3. The flight path of an eagle as it dives from a tree is given by $h(t) = 25 - 20t + 5t^2$, where $h(t)$ is the height above ground, in meters, t seconds after it begins its dive. Which equation represents the time, in seconds, that the eagle is 10 meters above the ground?

3. D

- A) $h(-10) = 25 - 20(-10) + 5(-10)^2$
- B) $h(10) = 25 - 20(10) + 5(10)^2$
- C) $-10 = 25 - 20t + 5t^2$
- D) $10 = 25 - 20t + 5t^2$

4. What are the zeros of the function $y = (4x - 1)(x + 3)$?

4. B

- A) -3 and 1
- B) -3 and $\frac{1}{4}$
- C) 3 and $-\frac{1}{4}$
- D) 3 and -1

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5. Which correctly represents the factored form of $y = x^2 - 13x - 30$?

- A) $y = (x - 10)(x - 3)$
- B) $y = (x + 10)(x + 3)$
- C) $y = (x - 15)(x + 2)$
- D) $y = (x + 15)(x - 2)$

5. C

6. The following question was solved incorrectly. In which line was the first mistake made?

$$0 = 2x^2 + 14x + 12$$

- A) Line 1: $0 = 2(x^2 + 7x + 12)$
- B) Line 2: $0 = 2(x + 3)(x + 4)$
- C) Line 3: $0 = (x + 3)$ or $0 = x + 4$
- D) Line 4: $x = 3$ or $x = 4$

6. A

7. How many x-intercept(s) does the function $f(x) = x^2 + 4x + 4$ have when graphed?

- A) 3
- B) 2
- C) 1
- D) 0

$$4^2 - 4(1)(4) \quad \text{or} \quad (x+2)(x+2) = 0$$

$$= 16 - 16 \quad \quad \quad x = -2$$

$$= 0$$

7. C

8. What are the root(s) of the equation $36x^2 = 49$?

- A) $\frac{6}{7}$ and $-\frac{6}{7}$
- B) $\frac{7}{6}$ and $-\frac{7}{6}$
- C) $\frac{6}{7}$
- D) $\frac{7}{6}$

$$36x^2 - 49 = 0$$

$$(6x - 7)(6x + 7) = 0$$

8. B

9. What are the x-intercept(s) of the graph for $y = 4x^2 - 6x$?

- A) -4 and 6
- B) 0 and $\frac{3}{2}$
- C) $\frac{3}{2}$
- D) 4 and -6

$$y = 2x(2x - 3)$$

$$x = 0 \quad x = \frac{3}{2}$$

9. B

10. Which equation below has x-intercepts at 3 and -4?

- A) $y = x^2 - x - 12$
- B) $y = x^2 - x - 7$
- C) $y = x^2 + x - 7$
- D) $y = x^2 + x - 12$

$$(x-3)(x+4)$$

$$x^2 + 4x - 3x - 12$$

$$x^2 + x - 12$$

10. D

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Part 2: Constructed Response (20 marks)

Show ALL necessary workings in the space provided to receive full credit.

11. Graph $y = x^2 - 2x - 8$ (4 marks)

a) Find the vertex. $x = \frac{-b}{2a} = \frac{2}{2} = 1$ $y = (1)^2 - 2(1) - 8 = -9$
 (1, -9)

b) Find the y-intercept

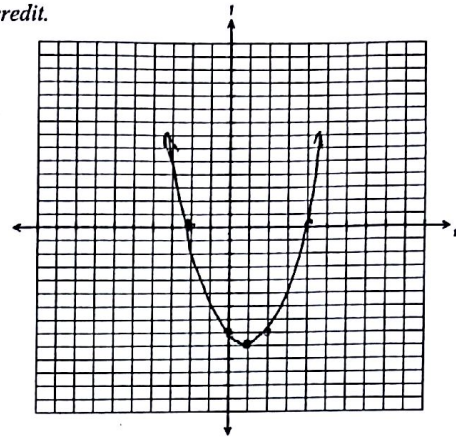
(0, -8)

c) Find the x-intercept(s), if any.

$0 = x^2 - 2x - 8$

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

$x = 4$ or $x = -2$



d) Graph the parabola.

12. Solve the following equations by **factoring**. (4 marks each)

a) $x(x-11) = -4(14-x)$

$x^2 - 11x = -56 + 4x$

$x^2 - 15x + 56 = 0$

$(x-7)(x-8) = 0$

$x = 7$ or $x = 8$

b) $8x^2 - 10x = 3$

$8x^2 - 10x - 3 = 0$

$8x^2 - 12x + 2x - 3 = 0$

$4x(2x-3) + (2x-3) = 0$

$(2x-3)(4x+1) = 0$

$p: -24$

$q: -10$

-12 and 2

$x = \frac{3}{2}$ or $x = -\frac{1}{4}$

13. Find the EXACT ROOTS of the equation $3x^2 - 2x - 4 = 0$ (4 marks)

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$= \frac{2 \pm \sqrt{4 + 48}}{6}$

$= \frac{2 \pm \sqrt{4 \times 13}}{6}$

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

$= \frac{2 \pm \sqrt{52}}{6}$

$= \frac{2 \pm 2\sqrt{13}}{6}$

$= \frac{1 \pm \sqrt{13}}{3}$

14. The owner of a new home would like to surround the paved rectangular driveway with a brick border of uniform width on all sides. The dimensions of the paved driveway are 24 feet by 10 feet. If the entire driveway and stone border is to have a total area of 312 square feet, determine the quadratic equation that models the area of the entire driveway and use it to algebraically determine the width of the paving stone border.

(4 marks)

$(2x+10)(2x+24) = 312$

$4x^2 + 48x + 20x + 240 = 312$

$4x^2 + 68x - 72 = 0$

$4(x^2 + 17x - 18) = 0$

$4(x+18)(x-1) = 0$

$x = 18$ or $x = 1$

Reject
 Negative Length.

The width of the
 border must be
 1 ft in length.

