

UNIT 3A TRASHKETBALL

Graphing Quadratic Functions

This game is comprised of 2 halves.

In the **first half**, each question is worth **2 points** and bonuses are worth **1 or 2 points**.

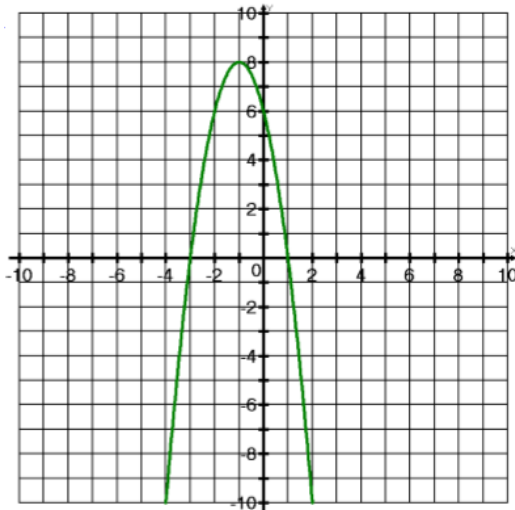
In the **second half**, each question is worth **3 points** and bonuses are worth **2 or 3 points**.

The **BUZZER BEATER** is worth **4 points** and the bonus must be a **3 point shot**.

FIRST HALF!

In this round, all questions are worth 2 points
and each bonus shot is worth 1 or 2 points.

QUESTION 1-1



Vertex: $(-1, 8)$

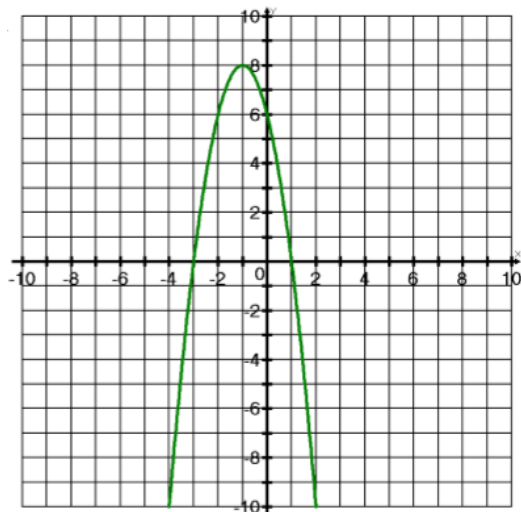
Axis of Symmetry: $x = -1$

Domain: all real numbers or
 $-\infty < x < \infty$

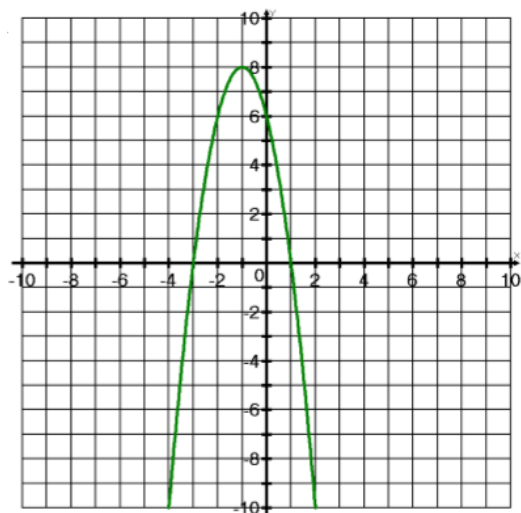
Range: $-\infty < y \leq 8$

$$y \leq 8$$

QUESTION 1-2

Extrema: *Maximum*Min/Max Value: $y = 8$ Zeroes: $x = -3, 1$ Y-Intercept: $(0, 6)$

QUESTION 1-3



Interval of Increase:

$$-\infty < x < -1$$

Interval of Decrease:

$$-1 < x < \infty$$

End Behavior:

$$\text{As } x \rightarrow -\infty, y \rightarrow \underline{-\infty}$$

$$\text{As } x \rightarrow \infty, y \rightarrow \underline{-\infty}$$

QUESTION 1-4

Identify the vertex, direction of opening, and all transformations for

$$f(x) = 1/3(x + 5)^2 - 6$$

Vertex: (-5, -6)

Opens: up

Transformations: vertical shrink of 1/3, shift left 5, shift down 6

QUESTION 1-5

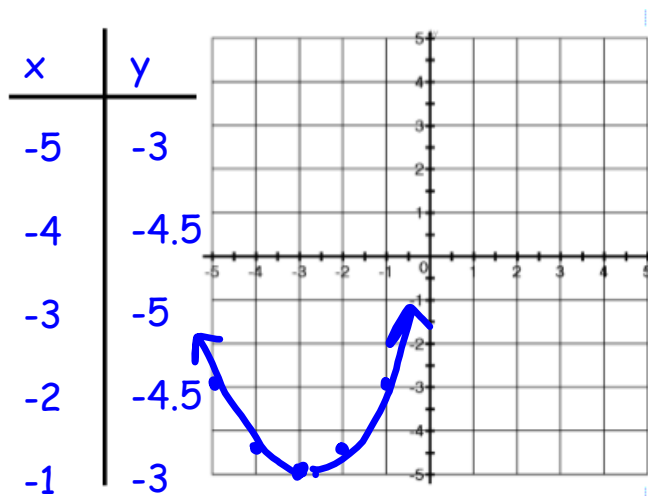
Write the equation of a quadratic function with the following transformations:

- Shifted down 7
- Reflected over x-axis
- Stretched by 2.5
- Shifted right 9

$$f(x) = -2.5(x - 9)^2 - 7$$

QUESTION 1-6

Create the correct 5-point table and graph the quadratic
 $f(x)=\frac{1}{2}(x + 3)^2 - 5$



HALFTIME!!

In the 2nd half, all questions are worth
3 points and each bonus shot is worth 2
or 3 points.

QUESTION 2-1

Convert the following equation into standard form.

$$f(x) = \frac{1}{2}(x + 3)^2 - 5$$

$$\frac{1}{2}(x + 3)(x + 3) - 5$$

$$\frac{1}{2}(x^2 + 6x + 9) - 5$$

$$\frac{1}{2}x^2 + 3x + 4.5 - 5$$

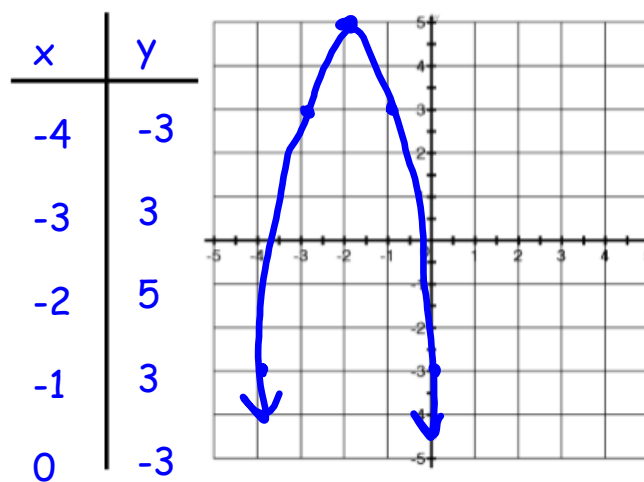
$$f(x) = \frac{1}{2}x^2 + 3x - .5 \quad \text{OR}$$

$$f(x) = \frac{1}{2}x^2 + 3x - \frac{1}{2}$$

QUESTION 2-2

Create the correct 5-point table and graph the quadratic

$$f(x) = -2x^2 - 8x - 3$$



QUESTION 2-3

Convert the following equation into vertex form.

$$f(x) = -3x^2 + 36x - 110$$

$$a = -3 \quad b = 36 \quad c = -110$$

$$h: -(36)/(2(-3)) = 6$$

$$k: -3(6)^2 + 36(6) - 110 = -2$$

$$f(x) = -3(x - 6)^2 - 2$$

QUESTION 2-4

Find the rate of change for $-4 < x < -1$ for the following

$$f(x) = -2x^2 - 8x - 3$$

$$f(-4) = -3$$

$$f(-1) = 3$$

$$\frac{3 - (-3)}{-1 - (-4)} = 2$$

BUZZER BEATER!!

THE LAST QUESTION IS WORTH 4 POINTS. IF YOU GET IT RIGHT, YOU MUST TRY FOR A 3-POINT SHOT. GO FOR THE GOLD!!

QUESTION 2-5

Find the rate of change for $1 < x < 7$ for the following

$$f(x) = -1/3(x-4)^2 - 8$$

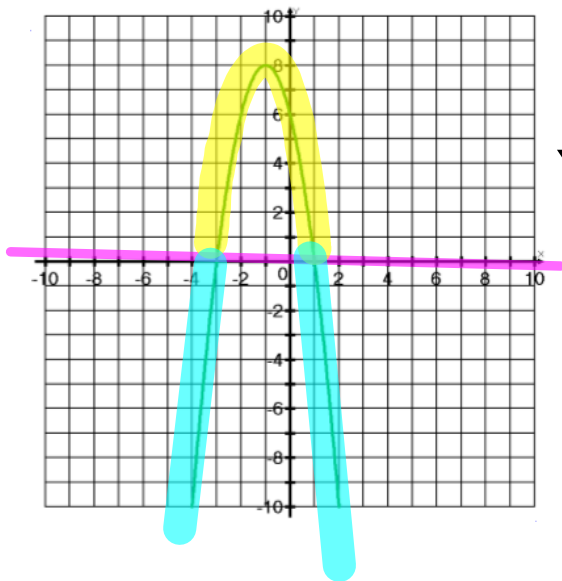
$$f(1) = -11$$

$$f(7) = -11$$

$$\frac{(-11 - (-11))}{(7 - 1)} = 0$$

QUESTION 2-6

$$Y > 0: -3 < X < 1$$



$$Y < 0: -\infty < X < -3$$

$$1 < X < \infty$$