

Name: \_\_\_\_\_

Class: \_\_\_\_\_

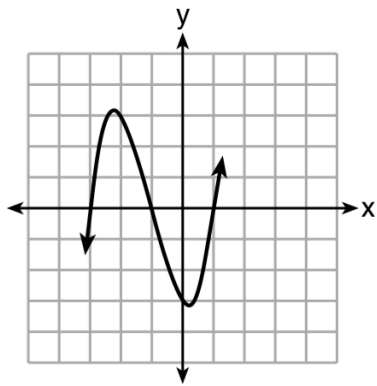
### Quadratics Day One: Solutions and Zeros

#### Question 1

Explain how to determine the zeros of  $f(x) = (x + 3)(x - 1)(x - 8)$ . State the zeros of the function.

#### Question 2

A cubic function is graphed on the set of axes below.



Which function could represent this graph?

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

(2)  $g(x) = (x + 3)(x + 1)(x - 1)$

(3)  $h(x) = (x - 3)(x - 1)(x + 3)$

(4)  $k(x) = (x + 3)(x + 1)(x - 3)$

#### Question 3

How many real-number solutions does  $4x^2 + 2x + 5 = 0$  have?

(1) one

(3) zero

(2) two

(4) infinitely many

#### Question 4

Solve for  $x$  to the *nearest* tenth:  $x^2 + x - 5 = 0$

#### Question 5

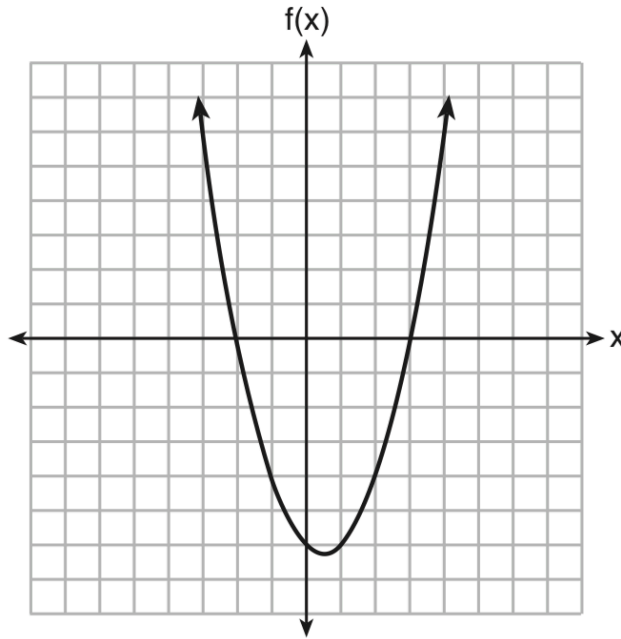
When an apple is dropped from a tower 256 feet high, the function  $h(t) = -16t^2 + 256$  models the height of the apple, in feet, after  $t$  seconds. Determine, algebraically, the number of seconds it takes the apple to hit the ground.

#### Question 6

If the zeros of a quadratic function,  $F$ , are  $-3$  and  $5$ , what is the equation of the axis of symmetry of  $F$ ? Justify your answer.

Question 7

The graph of the function  $f(x) = ax^2 + bx + c$  is given below.



Could the factors of  $f(x)$  be  $(x + 2)$  and  $(x - 3)$ ? Based on the graph, explain why or why *not*.

Question 8

Solve  $8m^2 + 20m = 12$  for  $m$  by factoring.

Question 9

Write an equation that defines  $m(x)$  as a trinomial where  $m(x) = (3x - 1)(3 - x) + 4x^2 + 19$ . Solve for  $x$  where  $m(x) = 0$ .

Questions 10-11

- |  |  |
|--|--|
| 10.  | 11.  |
| The zeros of the function $p(x) = x^2 - 2x - 24$ are | What are the solutions to the equation $3(x - 4)^2 = 27$ ? |
| (1) $-8$ and $3$                                     | (1) $1$ and $7$  |
| (2) $-6$ and $4$                                     | (2) $-1$ and $-7$  |
| (3) $-4$ and $6$                                     | (3) $4 \pm \sqrt{24}$                                      |
| (4) $-3$ and $8$                                     | (4) $-4 \pm \sqrt{24}$                                     |

Question 12

Which ordered pair would *not* be a solution to  $y = x^3 - x$ ?

- (1)  $(-4, -60)$                       (3)  $(-2, -6)$   
(2)  $(-3, -24)$                       (4)  $(-1, -2)$

Question 13

Determine algebraically the zeros of  $f(x) = 3x^3 + 21x^2 + 36x$ .

Question 14

A toy rocket is launched from the ground straight upward. The height of the rocket above the ground, in feet, is given by the equation  $h(t) = -16t^2 + 64t$ , where  $t$  is the time in seconds. Determine the domain for this function in the given context. Explain your reasoning.

Question 15

Find three consecutive odd integers such that the product of the first and the second exceeds the third by 8.

Question 16

Three brothers have ages that are consecutive even integers. The product of the first and third boys' ages is 20 more than twice the second boy's age. Find the age of each of the three boys.

Question 17-18

17. A student is asked to solve the equation  $4(3x - 1)^2 - 17 = 83$ . The student's solution to the problem starts as  $4(3x - 1)^2 = 100$
18. Solve the quadratic equation below for the exact values of  $x$ .

$$4x^2 - 5 = 75$$

$$(3x - 1)^2 = 25$$

A correct next step in the solution of the problem is

- 1)  $3x - 1 = \pm 5$   
2)  $3x - 1 = \pm 25$   
3)  $9x^2 - 1 = 25$   
4)  $9x^2 - 6x + 1 = 5$