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| /17K | /13A | /8C | /10T | Total | /48 |
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Name: _____ Date: _____

MCR3U

Test: Quadratic functions

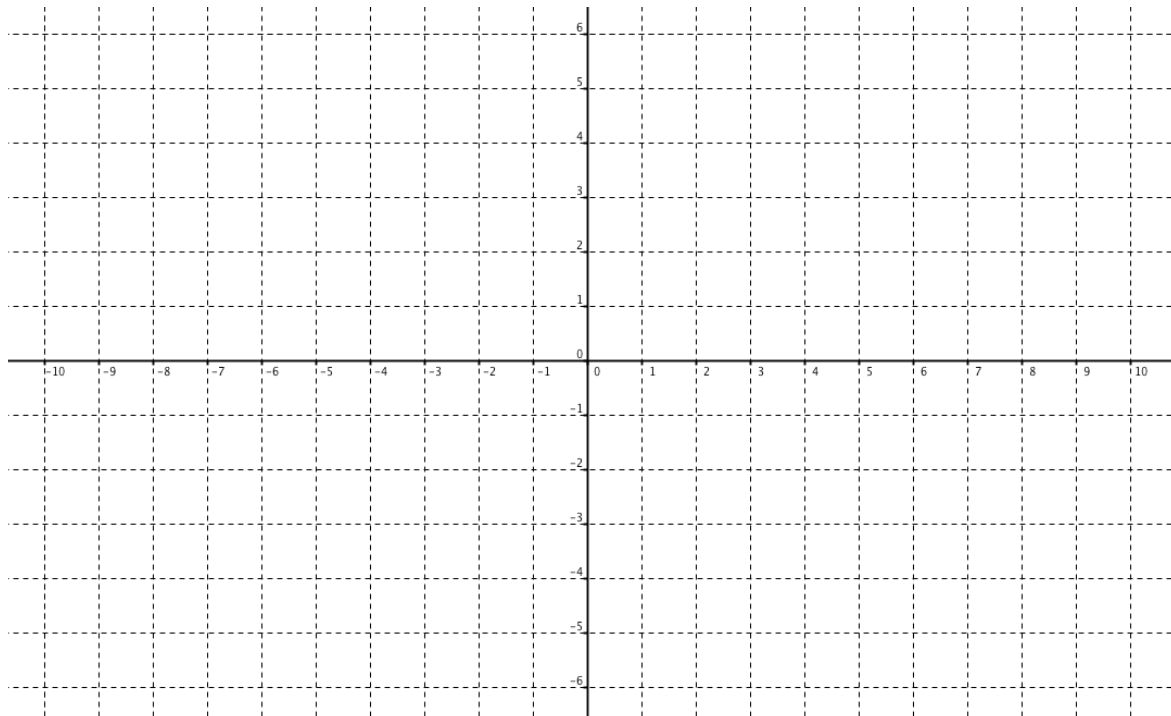
/9
K

1. Graph each of the following functions. Graphs should include all points that appear in the domain and range of the grid provided, with a smooth line passing through the points.

a) $g(x) = (x + 7)^2 - 4$

b) $r(x) = 1 - x^2$

c) $h(x) = 3x^2 + 30x + 69$



/4
T

2. An energy company x thousands of barrels of synfuel from coal, and estimates that the production cost, c , in dollars per barrel of synfuel can be modeled by the function $c(x) = 9x^2 - 144x + 940$. Determine the minimum production cost per barrel of synfuel.

/2
T

3. A banquet hall advertises that they will host a party for \$50 per person on New Year's Eve. They must have a guarantee of 30 people, but they agree that for each person in excess of 30 they will reduce the price per person for everyone by \$0.50. Determine the number of people that will maximise the hall's revenue.

/4
A

/3
A

4. Some math students are firing a potato launcher from the deck of their cottage and analysing the flight of each potato. They have modelled the height of a potato above the water, h metres, using the function $h(t) = -4.9t^2 + 15t + 30$, where t is the time in seconds after the potato is launched. Determine how long each potato is in the air.

/2
C

5. If a certain quadratic function has only one x-intercept, what does this tell us about its vertex. Sketch an example to justify your answer.

/6
K

6. Solve each of the following quadratic equations.

a) $3x^2 - 5x + 6 = 0$

b) $12x^2 - 27 = 0$

/4
T

7. Determine an equation in factored form for the quadratic function that contains the point $(0, 8)$ and has x-intercepts at 4 and -3 .

/2
C

8. State the transformations for the function $g(x) = -(x - 9)^2$ from the base graph $f(x) = x^2$.

/2
C

9. Describe how the graph of $g(x) = (3x)^2$ is different from the graph of $h(x) = 3x^2$.

/6
A

10. Determine the point(s) of intersection of the functions $f(x) = 2(x - 6)^2 - 1$ and $g(x) = 8x - 57$.

/2
K

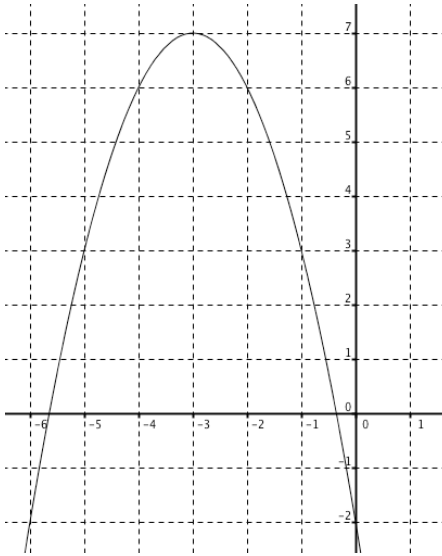
11. Write an equation for the quadratic function formed when the following transformations are applied to the base graph $f(x) = x^2$:

- stretched vertically by a factor of 4
- translated vertically 3 units down

/2
C

12. A student wrote the following equations for the graphs provided below. State the error in each of the equations (why do they NOT correctly represent the graphs?).

$$f(x) = -(x + 3) + 7$$



$$g(x) = (x + 1)(x + 5)$$

