Name: _____ Date: _____

Chapter 2 Practice Test

For questions 1 to 5, select the best answer.

1. The correct equation for the reflection of the function $y = 3x + 4$ in the y-axis is

A $y = 3x - 4$
B $y = -3x + 4$
C $y = -3x - 4$
D $y = 3x + 4$

2. The restriction(s) on the expression $\frac{2x^2 + 5x + 3}{4x^2 - 9}$ is (are)

A $x \neq 0$
B $x \neq \frac{3}{2}$
C $x \neq \frac{3}{2}, x \neq -\frac{3}{2}$
D $x \neq \frac{3}{2}, x \neq \frac{3}{2}, x \neq -1$

3. When dealing with a function that models a real-life situation, the function's inverse can be found by

A leaving the function in its original form
B reflecting the function in the x-axis
C reflecting the function in the y-axis
D rearranging the original equation for the second variable

4. When the function $g(x) = 3f(2x - 2) - 1$ is graphed based on $f(x)$, the horizontal translation is

A 2 units to the right
B 2 units to the left
C 1 unit to the right
D 1 unit to the left

5. The simplified form of the expression $\frac{2x^2 - 5x - 3}{2x^2 - 5x + 3}$ is

A -1
B $\frac{(2x+1)(x-3)}{(2x-1)(x-1)}$
C $\frac{2x-1}{2x+1}$
D $\frac{2x^2 - 5x - 3}{2x^2 - 5x + 3}$

6. Simplify each expression and state any restrictions.

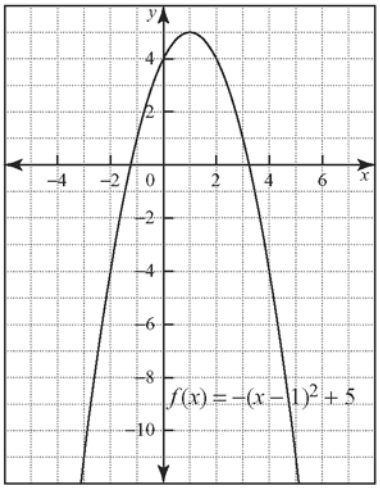
a) $\frac{3}{x^2 - 3x - 4} + \frac{2}{x^2 - 5x + 4}$

b) $\frac{x+1}{x^2 - 2x - 8} - \frac{2x+1}{x^2 - 3x - 4}$

c) $\frac{x^2 - x - 6}{x^2 - 2x - 3} \times \frac{x^2 + 5x + 4}{2x^2 - x - 10}$

d) $\frac{6x^2 - 11x - 35}{2x^2 - x - 21} \div \frac{3x^2 + 2x - 5}{x^2 - 2x - 15}$

7. Graph the inverse of the function shown. State whether the resulting inverse is a function.



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Name: _____ Date: _____

8. The base function $f(x) = x^2$ is transformed by a reflection in the x-axis, followed by, in order, a vertical stretch by a factor of 2, a horizontal compression by a factor of $\frac{1}{3}$, a horizontal translation of 2 units to the left, and a vertical translation of 1 unit down.

a) Determine the equation of the transformed function.

b) Create a sketch of the base function and the transformed function on the same set of axes.

c) Determine the domain and range for the transformed function.

9. A car rental company can rent 200 cars a day at a price of $50 per day. Research has shown that for every $2 increase in price, 5 fewer cars will be rented. If R represents the revenue for the company for x increase in the price of a rental car,

a) Write the expression for revenue as a function of the number of $2 price increases.

b) What will be the expected revenue if the price is increased by $6?

c) State the domain of the function.

d) Find the inverse of the revenue function.

10. Use the function $f(x) = \sqrt{x-2}$.

a) Write expressions for $f(-x)$, $-f(x)$, $-f(-x)$ and $f^{-1}(x)$.

b) Graph all five curves on the same set of axes.

11. The value of a motorcycle, in thousands of dollars, is given by the expression $V = \frac{12}{x+1} + 6$, where x represents the number of years since the motorcycle was purchased. Without making a table of values, create the graph of the value of the motorcycle as a function of x.

12. The approximate temperature, in degrees Celsius, of rock layers under Earth's surface can be determined by multiplying the depth of the layer, in kilometres, by a value of 35 and then adding 20 to the result of the multiplication. Let T represent the temperature in degrees Celsius and x represent the depth of the layer, in kilometres.

a) Write the equation for the temperature of a rock layer as a function of its depth.

b) What is the temperature of a rock layer at a depth of 3.5 km?

c) Write the inverse of this function.

d) At what depth does a rock layer have a temperature of 100 °C?

13. The function $f(x)$ includes the point (3, 7). Can the inverse of $f(x)$ include the point (–3, 3)? Explain your answer.

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