

Name: _____

Class: _____ Date: _____

Families Multiple Choice Post-Test

Multiple Choice

Identify the choice that best completes the statement or answers the question.

_____ **1** A balloon takes off from a location that is 45 ft above sea level. It falls at 3 ft/min. Write an equation to model the balloon's elevation h as a function of time t .

A $t(h) = 45h + 3$

B $h(t) = -3t + 45$

C $h(t) = 45t - 3$

D $t(h) = -3h + 45$

_____ **2** Let $f(x) = 3x - 5$ and $g(x) = x^2$, find $g(f(-2))$:

A -121

B 121

C 7

D -17

_____ **3** Compare the graphs of the pair of functions. Describe the family of functions they belong to and then describe how the graph of the second function relates to the graph of the first function.

$y = \log x$ and $y = \log(x - 1) + 2$

A They are logarithmic functions
The second function is the graph of
 $y = \log x$ moved 1 left and 2 up.

B They are trigonometric functions
The second function is the graph of
 $y = \log x$ moved 1 down and 2 right

C They are logarithmic functions
The second function is the graph of
 $y = \log x$ moved 1 right and 2 up.

D They are exponential functions
The second function is the graph of
 $y = \log x$ moved 1 up and 2 right.

_____ **4** If $f(x) = x - 7$ and $g(x) = \sqrt{x - 4}$, what is the value and domain of the function $\frac{f(x)}{g(x)}$?

A $\frac{\sqrt{x-4}}{x-7}, \{x|x < 4\}$

B $\frac{\sqrt{x-4}}{x-7}, \{x|x \leq 4\}$

C $\frac{x-7}{\sqrt{x-4}}, \{x|x \geq 4\}$

D $\frac{x-7}{\sqrt{x-4}}, \{x|x > 4\}$

_____ **5** Suppose $f(x) = 4x - 2$ and $g(x) = -2x + 1$. Find the value of $g(f(2))$.

- A** -11
- B** -14

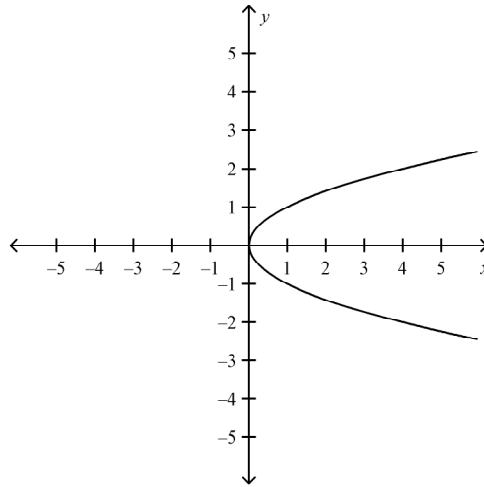
- C** 18
- D** 21

_____ **6** If $f(x) = 3x^2 - 1$, then $f(f(x)) =$

- A** $27x^4 - 18x^2 + 2$
- B** $81x^4 - 54x^2 + 8$

- C** $27x^4 + 2$
- D** $81x^4 - 10$

_____ **7** Determine whether this graph represents a function. If it is a function, state the family it would belong to and find the domain and range.



- A** Yes, it is a function, it is a quadratic
Domain: $\{x|x \geq 0\}$, Range: $\{y|y \in \mathfrak{R}\}$
- B** Yes, it is a function, it is a square root
Domain: $\{x|x \geq 0\}$, Range: $\{y|y \in \mathfrak{R}\}$

- C** No, it is not a function
Domain: $\{x|x \geq 0\}$, Range: $\{y|y \geq 0\}$
- D** No, it is not a function.
Domain: $\{x|x \geq 0\}$, Range: $\{y|y \in \mathfrak{R}\}$

_____ **8** Given a function $f(x)$, which of the following represents a vertical shift of 2 units upward, followed by a reflection across the x -axis?

A $f(-x) + 2$

C $-f(x) + 2$

B $f(2 - x)$

D $-f(x - 2)$

_____ **9** The Smiths rented a minivan for their family vacation. When they returned from vacation, the total bill for the van was \$685. The standard weekly rate from the rental company is \$355 plus \$55 for each additional day of usage. Write a linear function to represent this situation and then use that function to determine how many additional days did the Smiths have the minivan.

A $y = 55x + 355$; 5 days

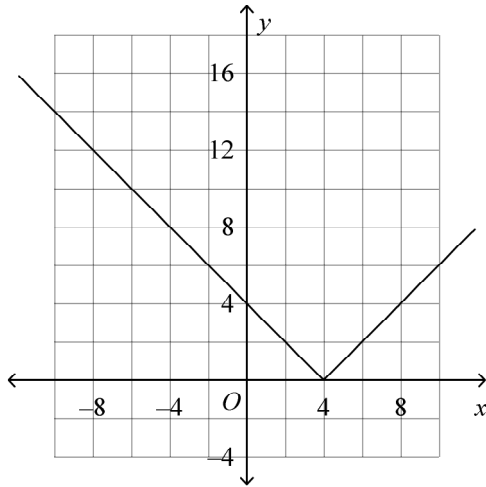
C $y = 355x + 55$; 3 days

B $y = 55x + 355$; 6 days

D $y = 55x + 685$; 4 days

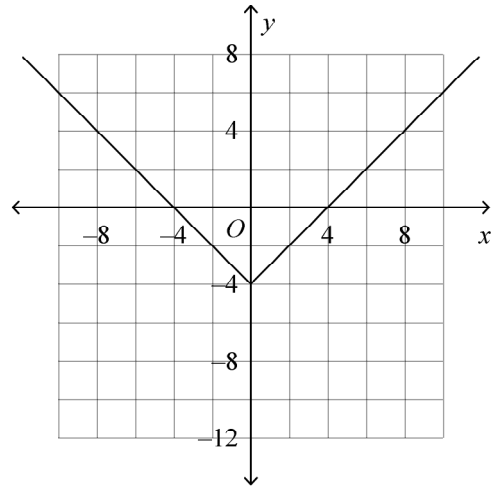
_____ **10** Graph the function: $y = |x| - 4$. State the translation of the parent function $y = |x|$.

A



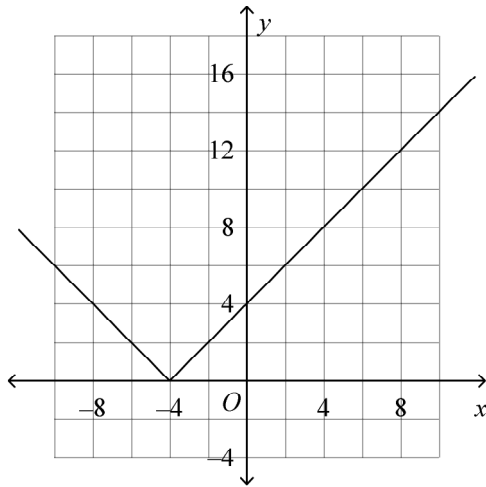
Translation: 4 right.

C



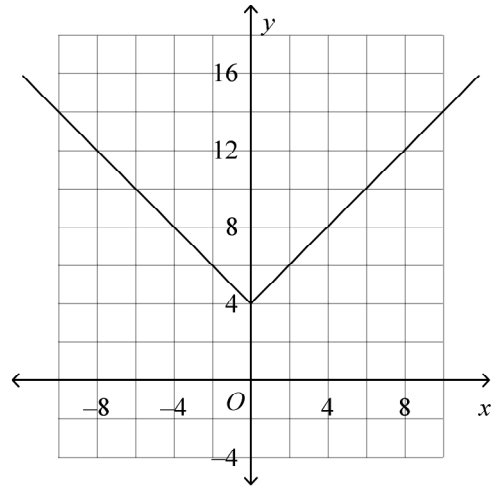
Translation: 4 down

B



Translation: 4 left

D



Translation: 4 up

_____ **11** Choose the correct range for the function: $f(x) = 35 + 5x$ where $0 \leq x \leq 5$ and x is an integer:

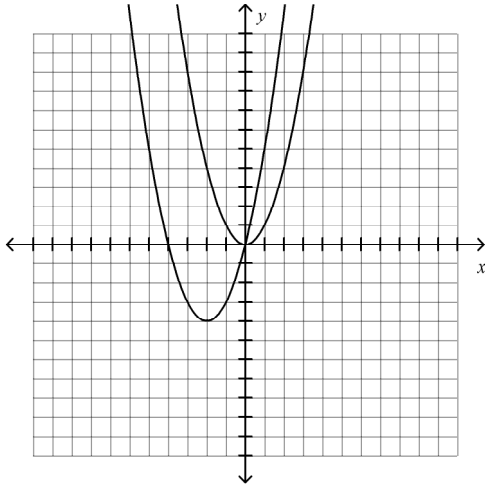
A 0, 1, 2, 3, 4, 5

B 1, 2, 3, 4, 5

C 35, 40, 45, 50, 55

D 35, 40, 45, 50, 55, 60

_____ 17 Write the equation for the translation of $y = x^2$.



A $y = (x - 2)^2 - 4$

B $y = (x + 2)^2 - 4$

C $y = (x - 2)^2 + 4$

D $y = (x + 2)^2 + 4$

_____ 18 If $f(x) = x^2 + x - 1$ and $g(x) = x - 4$, what is $f(x) \cdot g(x)$?

A $x^3 - 3x^2 - 5x + 4$

B $x^3 + x^2 - x$

C $-4x^2 - 4x + 4$

D $x^3 + 5x^2 + 3x + 4$

_____ 19 Which family of functions does $y = \sqrt{x - 3} + 2$ belong to? What is the domain and range of the function?

A It is a square root function
Domain: $\{x \mid x > -3\}$, Range: $\{y \mid y > 0\}$

B It is a square root function
Domain: $\{x \mid x \geq 3\}$, Range: $\{y \mid y \geq 2\}$

C It is a square function
Domain: $\{x \mid x < -3\}$, Range: $\{y \mid y \in \mathfrak{R}\}$

D It is a square function
Domain: $\{x \mid x \geq 3\}$, Range: $\{y \mid y \geq 2\}$

_____ **20** Which table below does *not* represent a function?

A

x	1	2	4	8
y	1	6	4	7

C

x	1	2	1	2
y	1	1	1	1

B

x	1	2	1	2
y	4	5	6	7

D

x	1	2	3	4
y	1	1	1	1

_____ **21** Determine the inverse to the function: $y = (x - 2)^3 - 1$. Is the inverse a function? What is the domain of the inverse?

A $y = \sqrt[3]{x+1} + 2$, yes it is a function,
Domain: $\{x|x \in \mathfrak{R}\}$

C $y = \sqrt[3]{x-1} - 2$, yes it is a function,
Domain: $\{x|x \in \mathfrak{R}\}$

B $y = \sqrt[3]{x+1} + 2$, no it is not a function,
Domain: $\{x|x \geq -1\}$

D $y = \sqrt[3]{x-1} - 2$, yes it is a function,
Domain: $\{x|x \geq -1\}$

_____ **22** Determine the inverse function to $f(x) = \log_4(x+3)$.

A $f^{-1}(x) = \log_4(x-3)$

C $f^{-1}(x) = 4^x - 3$

B $f^{-1}(x) = \log_4(y-3)$

D $f^{-1}(x) = 4^{x-3}$

For the next three questions, use the following information about a rectangular room: the width of the room is $(x + 1)$ and the length is $(2x - 3)$.

- _____ **23** What family of functions would best represent the perimeter of the rectangle? What family of functions would best represent the area of the rectangle?
- A** perimeter = quadratic, area = linear **C** perimeter = linear, area = square root
B perimeter = quadratic, area = cubic **D** perimeter = linear, area = quadratic
- _____ **24** What equation would model the perimeter of the rectangle? What equation would model the area of the rectangle?
- A** $P = 3x - 2$ **C** $P = 3x - 2$
 $A = 2x^2 - 3$ $A = 2x^2 - x - 3$
B $P = 6x - 4$ **D** $P = 6x - 4$
 $A = 2x^2 - 3$ $A = 2x^2 - x - 3$
- _____ **25** You have enough paper to make the width 8 inches. What is the value of x ? What is the perimeter? What is the area?
- A** $x = 7, P = 19, A = 95$ **C** $x = 7, P = 38, A = 88$
B $x = 9, P = 50, A = 150$ **D** $x = 9, P = 25, A = 159$
- _____ **26** Find the inverse of the function, $y = 4x - 8$. What are the x and y -intercepts of both functions?
- A** $y = 4x - 8, x$ -inter: $(2, 0)$ y -inter: $(0, -8)$ **C** $y = 4x - 8, x$ -inter: $(-8, 0)$ y -inter: $(0, 2)$
 $y = 4x + 8; x$ -inter: $(-2, 0)$ y -inter: $(0, 8)$ $y = \frac{1}{4}x + 2, x$ -inter: $(-8, 0)$ y -inter: $(0, 2)$
B $y = 4x - 8, x$ -inter: $(2, 0)$ y -inter: $(0, -8)$ **D** $y = 4x - 8, x$ -inter: $(2, 0)$ y -inter: $(0, -8)$,
 $y = x + 8; x$ -inter: $(-8, 0)$ y -inter: $(0, 8)$ $y = \frac{1}{4}x + 2, x$ -inter: $(-8, 0), y$ -inter: $(0, 2)$