

Algebraic Reasoning
Unit 4 Bundle 3 Summative Assessment

Name: _____ Date: _____

Multiple Choice

1. The function $h(x)$ is the result of an operation on $f(x)$ and $g(x)$. Find the function values for $h(x)$ in the table, then use finite differences to determine a function rule for $h(x)$.

x	1	2	3	4	5	6	7
$f(x) = x^2 + 17$	18	21	26	33	42	53	66
$g(x) = 4x$	4	8	12	16	20	24	28
$h(x) = (f + g)(x)$							

- A** $h(x) = 4x^3 + 17$
B $h(x) = x^2 + 4x + 17$
C $h(x) = x^2 + 21x$
D $h(x) = x^2 + 17(4x)$

2. Determine the operation that was used to create $h(x)$.

x	-2	-1	0	1	2
$f(x)$	-9	-3	3	9	15
$g(x)$	-6	-3	0	3	6
$h(x)$	-3	0	3	6	9

- A** Addition
B Subtraction
C Multiplication
D Division

3. Maddy earns a monthly salary of \$640 at a shipping company. She also earns a bonus of \$50 for each new customer she gets during the month. Her salary is then reduced by 25% for taxes and insurance. Which function best defines Maddy's net pay if $s(x) = 640 + 50x$ represents her gross monthly salary, where x is the number of new customers, and $w(x) = 0.25(640+50x)$ represents her withholdings?

- A** $(s + w)(x) = 640 + 87.5x$
B $(w - s)(x) = -480 - 37.5x$
C $(s - w)(x) = 480 + 37.5x$
D $(s \cdot w)(x) = (640 + 50x)(0.25(640+50x))$

4. David is building a scale model racing fence around the rectangular display mat for his model cars. The design of the mat calls for a length of 8 inches more than twice the width. The cost of the fence material is \$0.50 per inch. If x represents the width of the mat, write a function, $c(x)$, to represent the cost of the fencing.

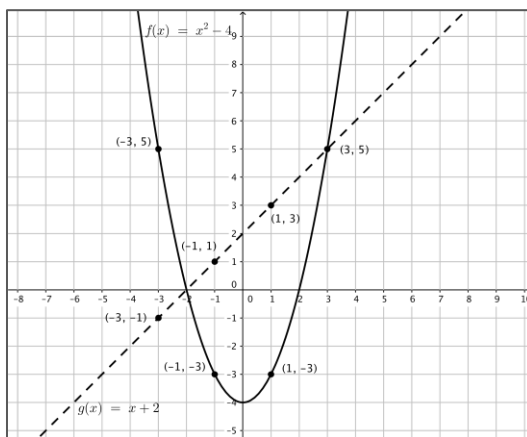
- A** $c(x) = 6x + 16$
B $c(x) = 3x + 16$
C $c(x) = (0.5)(2x^2 + 8x)$
D $c(x) = (0.5)(6x + 16)$

5. Use the table for the functions $f(x)$ and $g(x)$ to find the values for the quotient $h(x) = f(x) \div g(x)$. Then use finite differences to write the function rule for $h(x)$.

x	-2	-1	0	1	2
$f(x) = 2x^2 + 5x - 3$	-5	-6	-3	4	15
$g(x) = x + 3$	1	2	3	4	5
$h(x)$					

- A** $h(x) = 2x - 1$
B $h(x) = 2x - 5$
C $h(x) = 2x - 3$
D $h(x) = 2x$

6. Use the graph, $f(x) = x^2 - 4$, and $g(x) = x + 2$ to determine values for $h(x) = f(x) \div g(x)$ and write the equation for $h(x)$.



x	-3	-1	1	3
$f(x)$				
$g(x)$				
$h(x)$				

- A** $h(x) = x - 2$
B $h(x) = -2x - 2$
C $h(x) = 2x - 5$
D $h(x) = x + 2$

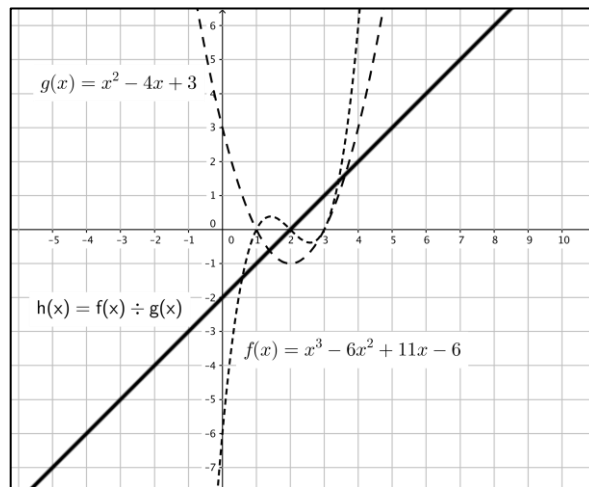
7. Find $h(x) = f(x) \div g(x)$ and $j(x) = g(x) \div f(x)$ for $f(x) = 3x^2 + 2x - 8$ and $g(x) = x + 2$.

- A** $h(x) = 3x + 4; j(x) = \frac{1}{3x+4}$
B $h(x) = 3x - 4; j(x) = \frac{1}{3x-4}$
C $h(x) = 3x - 4; j(x) = \frac{1}{3x+4}$
D $h(x) = 3x + 4; j(x) = \frac{1}{3x-4}$

8. If $f(x) = x + 1.5$ and $g(x) = 5x^2$, what is $g(f(x))$?

- A** $g(f(x)) = 5x^3 + 7.5x^2$
B $g(f(x)) = 5x^2 + 11.25$
C $g(f(x)) = 5x^2 + 15x + 11.25$
D $g(f(x)) = 5x^2 + 15x + 2.25$

9. Use the graph and values for $f(x) = x^3 - 6x^2 + 11x - 6$ and $g(x) = x^2 - 4x + 3$ to complete the values for $h(x) = f(x) \div g(x)$ in the table. Choose the equation representing the values for function $h(x) = f(x) \div g(x)$.



x	0	2	4
h(x)			

- A** $h(x) = 2x + 1$
- B** $h(x) = 2x$
- C** $h(x) = x + 1$
- D** $h(x) = x - 2$
10. The band is selling t-shirts as a fundraiser for new uniforms. The cost to produce the t-shirts is \$4 per shirt plus a one-time design fee of \$100. The team is selling the shirts for \$10 apiece. The function $c(x) = 4x + 100$ can be used to represent the cost of producing x number of t-shirts. The function $r(x) = 10x$ can be used to represent the amount of revenue the team would receive for selling x t-shirts. Choose the function $p(x)$, in terms of $c(x)$ and $r(x)$, that can be used to calculate the profit the team would make from selling x t-shirts.

- A** $p(x) = r(x) + c(x)$
 $p(x) = 14x + 100$
- B** $p(x) = c(x) - r(x)$
 $p(x) = -6x + 100$
- C** $p(x) = r(x) - c(x)$
 $p(x) = 6x - 100$
- D** $p(x) = r(x) \cdot c(x)$
 $p(x) = 10x(4x + 100)$