

Name _____
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Algebra II

Operations with Functions

For the following pairs of functions, find $f(x)+g(x)$, $f(x)-g(x)$, $f(x)\bullet g(x)$, and $\frac{f(x)}{g(x)}$

1. $f(x) = 2x - 8$
 $g(x) = 4x - 16$

2. $f(x) = 2x - 8$
 $g(x) = 3x - 12$

3. $f(x) = x^2 - 9$
 $g(x) = 4x + 12$

4. $f(x) = x^2 - 5x - 17$
 $g(x) = x + 2$

5. If $g(c) = 1 - c^2$ and $m(c) = c + 1$, then which statement is *not* true?

1) $g(c) \cdot m(c) = 1 + c - c^2 - c^3$ 3) $m(c) - g(c) = c + c^2$

2) $g(c) + m(c) = 2 + c - c^2$ 4) $\frac{m(c)}{g(c)} = \frac{-1}{1 - c}$

6. If $f(x) = x^2 + 9$ and $g(x) = x + 3$, which operation would not result in a polynomial expression?

1) $f(x) + g(x)$

3) $f(x) \cdot g(x)$

2) $f(x) - g(x)$

4) $f(x) \div g(x)$

7. Given: $f(x) = 2x^2 + x - 3$ and $g(x) = x - 1$

Express $f(x) \cdot g(x) - [f(x) + g(x)]$ as a polynomial in standard form.

8. The profit function, $p(x)$, for a company is the cost function, $c(x)$, subtracted from the revenue function, $r(x)$. The profit function for the Acme Corporation is

$p(x) = -0.5x^2 + 250x - 300$ and the revenue function is $r(x) = -0.3x^2 + 150x$. The cost function for the Acme Corporation is

1) $c(x) = 0.2x^2 - 100x + 300$

3) $c(x) = -0.2x^2 + 100x - 300$

2) $c(x) = 0.2x^2 + 100x + 300$

4) $c(x) = -0.8x^2 + 400x - 300$

9. A manufacturing company has developed a cost model, $C(x) = 0.15x^3 + 0.01x^2 + 2x + 120$, where x is the number of items sold, in thousands. The sales price can be modeled by $S(x) = 30 - 0.01x$. Therefore, revenue is modeled by $R(x) = x \cdot S(x)$. The company's profit, $P(x) = R(x) - C(x)$, could be modeled by

1) $0.15x^3 + 0.02x^2 - 28x + 120$

3) $-0.15x^3 + 0.01x^2 - 2.01x - 120$

2) $-0.15x^3 - 0.02x^2 + 28x - 120$

4) $-0.15x^3 + 32x + 120$