

Name: _____

EOC Review #5

12) If $f(x) = 3x^6$ and $g(x) = 4x^3$, what is the product of the two functions?

- a. $7x^9$
- b. $7x^{18}$
- c. $12x^9$
- d. $12x^{18}$

$12x^9$

13) If $f(x) = \sqrt{x} - 2x$ and $g(x) = \frac{x}{5-x}$, what is $f(g(x))$?

- A. $\sqrt{\frac{x}{5-x}} - \frac{2x}{5-x}$
- B. $5 - \sqrt{x} + 2x$
- C. $\sqrt{x} - 2x$
- D. $\frac{x\sqrt{x} - 2x^2}{5-x}$

$\sqrt{\frac{x}{5-x}} - 2\left(\frac{x}{5-x}\right)$

15) Janine created a function $f(x)$ so that $f(x) = k(x) - g(x)$. If $g(x) = -5x^3 + 4x^2 - 3x + 7$ and $k(x) = 9 - 7x + 5x^2 - 4x^3$, which expression represents $f(x)$?

- a. $f(x) = x^3 + x^2 - 4x + 2$
- b. $f(x) = x^3 + 9x^2 - 4x + 2$
- c. $f(x) = 14x^3 - 11x^2 + 8x - 11$
- d. $f(x) = -9x^3 + 9x^2 - 10x + 16$

$9 - 7x + 5x^2 - 4x^3 - (-5x^3 + 4x^2 - 3x + 7)$
 $9 - 7x + 5x^2 - 4x^3 + 5x^3 - 4x^2 + 3x - 7$
 $x^3 + x^2 - 4x + 2$

17) If $f(x) = 3x + 7$ and $g(x) = x^2 - x$, then which is true?

- a. $f(g(x)) = x^2 + 2x + 7$
- b. $f(g(x)) = 3x^2 - 3x + 7$
- c. $f(g(x)) = 3x^3 + 4x^2 - 7x$
- d. $f(g(x)) = 9x^2 + 39x + 42$

$3(x^2 - x) + 7$
 $3x^2 - 3x + 7$

16) Consider the functions $f(x) = 3\sqrt{\frac{x}{2}}$ and $g(x) = 4x^2$. Find and simplify $(g \circ f)(x)$ for $x > 0$.

- A. $\frac{4}{3}\sqrt{\frac{x^3}{8}}$
- B. $3\sqrt{2}x$
- C. $12x^2\sqrt{\frac{x}{2}}$
- D. $18x$

$4\left(3\sqrt{\frac{x}{2}}\right)^2$
 $4\left(9\frac{x}{2}\right)$
 $36\frac{x}{2}$
 $18x$

17) Let $P(x) = 2x^3 - 2x^2 + 3$ and let $Q(x)$ be a polynomial function with integer coefficients, such that the composition function $(P \circ Q)(x)$ is a polynomial of degree 15. If it can be determined, what is the degree of $Q(x)$?

- A. 5
- B. 12
- C. 15

Plug Q into P
 degree = 15
 3-degree of Q
 to get 15
 has to be 5

D. The degree of $Q(x)$ cannot be determined from the given information.

18) $f(x) = \frac{1}{x}$ and $g(x) = x + 2$, what is $g(f(4))$?

- a. $\frac{1}{6}$
- b. $\frac{3}{2}$
- c. $\frac{9}{4}$
- d. $\frac{25}{4}$

$\frac{1}{4} + 2$

19) If $f(x) = x^2$ and $g(x) = x - 3$, then what is $(f \circ g)(5)$?

- a. 4
- b. 22
- c. 27
- d. 50

$5 - 3 = 2$
 $2^2 = 4$

24) Given $f(x) = x^2 + 3$, what is $f^{-1}(x)$?

a. $f^{-1}(x) = x - 3$

b. $f^{-1}(x) = \sqrt{x - 3}$

c. $f^{-1}(x) = -x^2 - 3$

d. $f^{-1}(x) = \frac{1}{x^2 + 3}$

$y = x^2 + 3$
 $x = y^2 + 3$
 $x - 3 = y^2$
 $\sqrt{x - 3} = y$

25) Given $f(x) = \sqrt{9 - x}$, which function is the inverse of $f(x)$?

a. $g(x) = 9 - x^2, x \leq 0$

b. $g(x) = 9 - x^2, x \geq 0$

c. $g(x) = (x + 9)^2, x \geq 0$

d. $g(x) = (x + 9)^2, x \leq 0$

Domain: $x \geq 0$
 Range flip when inverse
 so $y \geq 0$
 in $f(x)$ means $x \geq 0$ in $g(x)$

$y = \sqrt{9 - x}$
 $x = \sqrt{9 - y}$
 $x^2 = 9 - y$
 $x^2 - 9 = -y$

79) Determine the domain and range of $y = 2x^2 + 2x - 4$.

A. Domain: $-2 \leq x \leq 1$

Range: $y \geq -\frac{9}{2}$ and $y \leq \frac{9}{2}$

B. Domain: all real numbers

Range: $-2 \leq x \leq 1$

C. Domain: all real numbers

Range: $y \leq -\frac{9}{2}$

D. Domain: all real numbers

Range: $y \geq -\frac{9}{2}$

calc

84) A certain relation is defined by these ordered pairs:

$\{(2, 2), (-2, 2), (2, -2), (-2, -2)\}$

If this relation is translated 5 units to the right, what is the resulting relation?

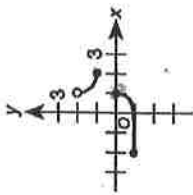
A. $\{(2, 7), (-2, 7), (2, 3), (-2, 3)\}$

B. $\{(7, 7), (5, 7), (7, 3), (5, 3)\}$

C. $\{(10, 2), (-10, 2), (10, -2), (-10, -2)\}$

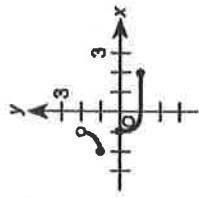
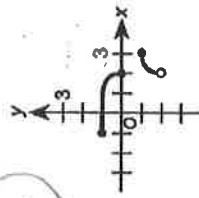
D. $\{(7, 2), (3, 2), (7, -2), (3, -2)\}$

88) This graph shows $y = f(x)$. What is the graph of $y = -f(x - 1)$?

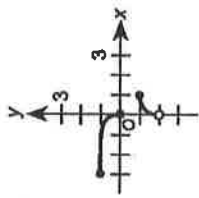


flips across x-axis

move to right 1



C.



89) If $f(x) = |x - 1| - 2$, what is the vertex of $y = f(x + 2) - 1$?

A. $(-2, -1)$

B. $(-1, -3)$

C. $(2, -1)$

D. $(3, -3)$

vertex of orig $(-1, -3)$

left 2 down 1

102) Where will the graph of $f(x) = 3x^2 - 6x^2 + 5x - 10$ cross the x-axis?

A. $x = \sqrt{\frac{5}{3}}, 2$

B. $x = -\sqrt{\frac{5}{3}}$

C. $x = 2$

D. $x = -\sqrt{\frac{5}{3}}, 2$

calc

116) How many times does $f(x) = 4x^2 - 3x$ cross the x-axis?

A. 2

B. 3

C. 4

D. 5

calc