Name_____

MAT110NA: College Algebra

HW #3

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Determine whether the relation represents a function. If it is a function, state the domain and range.

1) {(41, -3), (5, -2), (5, 0), (9, 2), (21, 4)} 1) _____

A) function
domain: {41, 9, 5, 21}
range: {-3, -2, 0, 2, 4}

B) function
domain: {-3, -2, 0, 2, 4}
range: {41, 9, 5, 21}

C) not a function

2) {(-4, 21), (-3, 14), (0, 5), (3, 14), (5, 30)} 2) _____

A) function
domain: {21, 14, 5, 30}
range: {-4, -3, 0, 3, 5}

B) function
domain: {-4, -3, 0, 3, 5}
range: {21, 14, 5, 30}

C) not a function

Determine whether the equation defines y as a function of x.

3) $y^2 = 8 - x^2$ 3) _____

A) function

B) not a function

4) $y = 6x^2 - 5x + 8$ 4) _____

A) function

B) not a function

Find the value for the function.

5) Find f(2) when $f(x) = \frac{x^2 - 4}{x + 1}$. 5) _____

A) $\frac{8}{3}$ B) $\frac{4}{3}$ C) - 2 D) 0

6) Find f(5) when $f(x) = \sqrt{x^2 + 7x}$. 6) _____

A) $2\sqrt{15}$ B) $2\sqrt{14}$ C) $\sqrt{74}$ D) $4\sqrt{2}$

7) Find f(x - 1) when $f(x) = 3x^2 - 4x + 2$. 7) _____

A) $3x^2 - 10x + 9$ B) $3x^2 + 2x + 1$ C) $3x^2 - 10x + 1$ D) $-10x^2 + 3x + 9$

8) Find f(x + 1) when $f(x) = \frac{x^2 - 2}{x - 3}$. 8) _____

A) $\frac{x^2 + 2x - 1}{x + 4}$ B) $\frac{x^2 + 2x - 1}{x - 2}$ C) $\frac{x^2 - 1}{x - 2}$ D) $\frac{x^2 + 2x + 3}{x - 2}$

For the given functions f and g, find the requested function and state its domain.

9) $f(x) = x - 2$; $g(x) = 9x^2$ 9) _____

Find f + g.

A) $(f + g)(x) = 9x^2 - x + 2$; all real numbers

B) $(f + g)(x) = -9x^2 + x - 2$; all real numbers

C) $(f + g)(x) = 9x^2 + x - 2$; $\{x | x \neq 2\}$

D) $(f + g)(x) = 9x^2 + x - 2$; all real numbers

10) $f(x) = 2x^3 - 1$; $g(x) = 5x^2 - 1$ 10) _____

Find $f \cdot g$.

A) $(f \cdot g)(x) = 10x^5 - 2x^3 - 5x^2 + 1$; $\{x \mid x \neq 0\}$

B) $(f \cdot g)(x) = 10x^5 - 2x^3 - 5x^2 + 1$; all real numbers

C) $(f \cdot g)(x) = 2x^3 + 5x^2 + 1$; all real numbers

D) $(f \cdot g)(x) = 10x^6 - 2x^3 - 5x^2 + 1$; all real numbers

Solve the problem.

11) Find $(f + g)(-2)$ when $f(x) = x + 2$ and $g(x) = x - 1$. 11) _____

A) -5 B) -7 C) -1 D) -3

12) Find $(f - g)(4)$ when $f(x) = 4x^2 + 5$ and $g(x) = x - 1$. 12) _____

A) 66 B) 64 C) -73 D) 74

13) Find $(fg)(4)$ when $f(x) = x - 1$ and $g(x) = -2x^2 + 12x - 5$. 13) _____

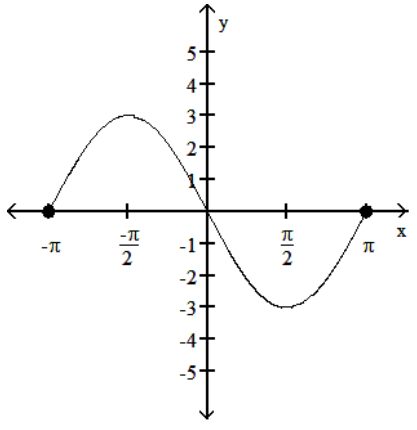
A) 177 B) 55 C) 33 D) -185

14) Find $\left(\frac{f}{g}\right)(-3)$ when $f(x) = 2x - 1$ and $g(x) = 4x^2 + 14x + 2$. 14) _____

A) $\frac{4}{5}$ B) $\frac{7}{4}$ C) - 1 D) 0

The graph of a function is given. Decide whether it is even, odd, or neither.

15) 15) _____



A) even B) odd C) neither

For the given functions f and g, find the requested composite function value.

16) $f(x) = 4x + 4$, $g(x) = 4x^2 + 3$; Find $(f \circ f)(2)$. 16) _____

A) 1447 B) 52 C) 80 D) 579

17) $f(x) = \frac{x - 6}{x}$, $g(x) = x^2 + 9$; Find $(g \circ f)(-2)$. 17) _____

A) $\frac{145}{16}$ B) $\frac{7}{13}$ C) 25 D) 13

18) $f(x) = 2x + 4$, $g(x) = 4x^2 + 1$; Find $(g \circ f)(4)$. 18) _____

A) 134 B) 577 C) 16,901 D) 28

For the given functions f and g, find the requested composite function.

19) $f(x) = 5x + 11$, $g(x) = 3x - 1$; Find $(f \circ g)(x)$. 19) _____

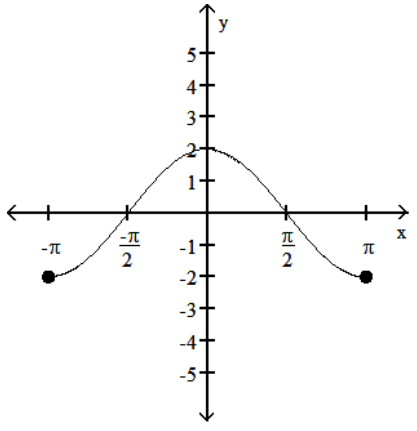
A) $15x + 6$ B) $15x + 32$ C) $15x + 10$ D) $15x + 16$

20) $f(x) = -6x + 9$, $g(x) = 2x + 8$; Find $(g \circ f)(x)$. 20) _____

A) $-12x + 57$ B) $12x + 26$ C) $-12x - 10$ D) $-12x + 26$

The graph of a function is given. Decide whether it is even, odd, or neither.

21) 21) _____



A) even B) odd C) neither

Decide whether or not the functions are inverses of each other.

22) $f(x) = (x - 2)^2$, $x \geq 2$; $g(x) = \sqrt{x} + 2$ 22) _____

A) Yes B) No

The function f is one-to-one. Find its inverse.

23) $f(x) = 3x - 7$ 23) _____

A) $f^{-1}(x) = \frac{x + 7}{3}$ B) $f^{-1}(x) = \frac{x - 7}{3}$ C) $f^{-1}(x) = \frac{x}{3} + 7$ D) $f^{-1}(x) = \frac{x}{3} - 7$

24) $f(x) = \frac{2}{x}$ 24) _____

A) $f^{-1}(x) = \frac{x}{2}$ B) $f^{-1}(x) = \frac{2}{x}$ C) $f^{-1}(x) = -2x$ D) $f^{-1}(x) = 2x$

25) $f(x) = x^3 - 3$ 25) _____

A) $f^{-1}(x) = \sqrt[3]{x - 3}$ B) $f^{-1}(x) = \sqrt[3]{x + 3}$ C) $f^{-1}(x) = \sqrt[3]{x} - 3$ D) $f^{-1}(x) = \sqrt[3]{x} + 3$