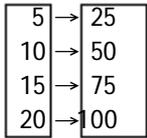Name_____

Date: _____

MAT110NA: College Algebra

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)   1) _____
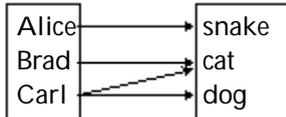
| 5 → 25 |
| 10 → 50 |
| 15 → 75 |
| 20 → 100 |

    A) function   B) function   C) not a function
       domain:{25, 50, 75, 100}   domain: {5, 10, 15, 20}
       range: {5, 10, 15, 20}   range: {25, 50, 75, 100}

2)   2) _____

| Alice → snake |
| Brad → cat |
| Carl → dog |

    A) function
       domain: {snake, cat, dog}
       range: {Alice, Brad, Carl}
    B) function
       domain: {Alice, Brad, Carl}
       range: {snake, cat, dog}
    C) not a function

3) $\{(-1, -7), (0, 5), (5, 0), (8, -2)\}$ 3) _____
    A) function   B) function   C) not a function
       domain: {-1, 0, 5, 8}   domain: {-7, 5, 0, -2}
       range: {-7, 5, 0, -2}   range: {-1, 0, 5, 8}

4) $\{(41, -3), (5, -2), (5, 0), (9, 2), (21, 4)\}$ 4) _____
    A) function   B) function   C) not a function
       domain: {41, 9, 5, 21}   domain: {-3, -2, 0, 2, 4}
       range: {-3, -2, 0, 2, 4}   range: {41, 9, 5, 21}

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

5) $y = |x|$ 5) _____
    A) function   B) not a function

Find the value for the function.

6) Find $f(-1)$ when $f(x) = x^2 + 2x + 5$.   6) _____
    A) 4   B) 8   C) -6   D) -2

1

7) Find $f(2)$ when $f(x) = \dfrac{x^2 - 4}{x + 1}$.

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

7) _____

8) Find $f(-9)$ when $f(x) = |x| - 6$.

    A) -3   B) 3   C) -15   D) 15

8) _____

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

9) $f(x) = 2 - 7x$; $g(x) = -5x + 7$
   Find $f + g$.

9) _____

    A) $(f + g)(x) = -3x$; all real numbers   B) $(f + g)(x) = -12x + 9$; all real numbers

    C) $(f + g)(x) = -5x + 2$; $\{x \mid x \neq \frac{2}{5}\}$ D) $(f + g)(x) = -2x + 9$; $\{x \mid x \neq -\frac{9}{2}\}$

10) $f(x) = 8x - 2$; $g(x) = 4x - 8$
   Find $f - g$.

10) _____

    A) $(f - g)(x) = 4x + 6$; all real numbers   B) $(f - g)(x) = 4x - 10$; $\{x \mid x \neq \frac{5}{2}\}$

    C) $(f - g)(x) = -4x - 6$; all real numbers   D) $(f - g)(x) = 12x - 10$; $\{x \mid x \neq 1\}$

11) $f(x) = 2x + 2$; $g(x) = 5x - 1$
   Find $f \cdot g$.

11) _____

    A) $(f \cdot g)(x) = 10x^2 + 9x - 2$; $\{x \mid x \neq -2\}$ B) $(f \cdot g)(x) = 10x^2 - 2$; $\{x \mid x \neq -2\}$

    C) $(f \cdot g)(x) = 7x^2 + 8x + 1$; all real numbers   D) $(f \cdot g)(x) = 10x^2 + 8x - 2$; all real numbers

12) $f(x) = 5x + 1$; $g(x) = 3x - 5$
   Find $\dfrac{f}{g}$.

12) _____

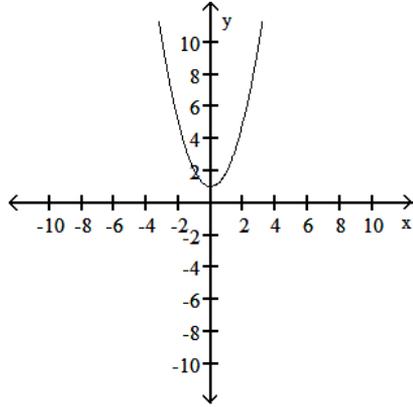   A) $\left(\dfrac{f}{g}\right)(x) = \dfrac{5x + 1}{3x - 5}$; $\left\{x \mid x \neq -\dfrac{1}{5}\right\}$ B) $\left(\dfrac{f}{g}\right)(x) = \dfrac{3x - 5}{5x + 1}$; $\left\{x \mid x \neq -\dfrac{1}{5}\right\}$

    C) $\left(\dfrac{f}{g}\right)(x) = \dfrac{5x + 1}{3x - 5}$; $\left\{x \mid x \neq \dfrac{5}{3}\right\}$ D) $\left(\dfrac{f}{g}\right)(x) = \dfrac{3x - 5}{5x + 1}$; $\left\{x \mid x \neq \dfrac{5}{3}\right\}$

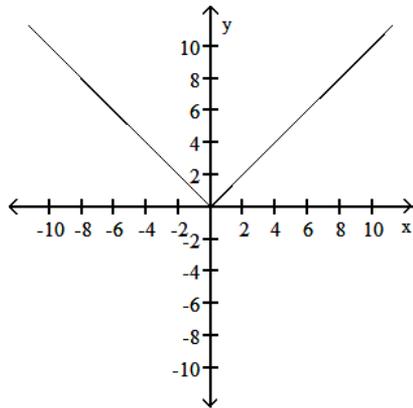The graph of a function is given. Decide whether it is even, odd, or neither.

13)

13) _____

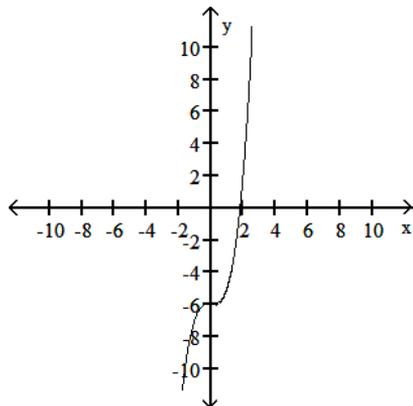A) even   B) odd   C) neither

14)

14) _____

A) even   B) odd   C) neither

15)

15) _____

A) even   B) odd   C) neither

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

16) $f(x) = \sqrt{x + 2}$, $g(x) = 2x$;   Find $(f \circ g)(1)$.

16) _____

   A) $2\sqrt{6}$ B) $\sqrt{6}$ C) $2\sqrt{3}$ D) 2

17) $f(x) = 4x + 4$, $g(x) = 4x^2 + 3$;   Find $(f \circ f)(2)$.   17) _____
   A) 80   B) 579   C) 52   D) 1447

18) $f(x) = 4x + 6$, $g(x) = 4x^2 + 1$;   Find $(f \circ g)(4)$.   18) _____
   A) 266   B) 94   C) 1937   D) 16,901

19) $f(x) = |7x^2 - 7x|$, $g(x) = 17x - 10$;   Find $(f \circ g)(12)$.   19) _____
   A) 15,698   B) 179,256   C) 262,094   D) 246,396

20) $f(x) = 5x + 5$, $g(x) = -1/x$;   Find $(g \circ f)(3)$.   20) _____
   A) $-\dfrac{20}{3}$ B) $\dfrac{59}{3}$ C) $\dfrac{10}{3}$ D) $-\dfrac{1}{20}$

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

21) $f(x) = x^3 - 3$ 21) _____

   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) $f^{-1}(x) = \sqrt[3]{x - 3}$

22) $f(x) = \dfrac{7x + 5}{8}$ 22) _____

   A) $f^{-1}(x) = \dfrac{8}{7x + 5}$ B) $f^{-1}(x) = \dfrac{8}{7x - 5}$ C) $f^{-1}(x) = \dfrac{8x + 5}{7}$ D) $f^{-1}(x) = \dfrac{8x - 5}{7}$

23) $f(x) = \dfrac{4}{7x + 3}$ 23) _____

   A) $f^{-1}(x) = \dfrac{7x + 3}{4}$ B) $f^{-1}(x) = \dfrac{3x - 4}{7x}$ C) $f^{-1}(x) = \dfrac{4 - 3x}{7x}$ D) $f^{-1}(x) = \dfrac{4 - 3y}{7y}$

24) $f(x) = \dfrac{7}{x + 7}$ 24) _____

   A) $f^{-1}(x) = \dfrac{7 + 7x}{x}$ B) $f^{-1}(x) = \dfrac{7 + 7x^2}{x}$

   C) $f^{-1}(x) = \dfrac{x}{7 + 7x}$ D) $f^{-1}(x) = \dfrac{-7x + 7}{x}$

25) $f(x) = (x - 5)^3$ 25) _____

   A) $f^{-1}(x) = \sqrt[3]{x} - 5$ B) $f^{-1}(x) = \sqrt{x} + 5$

   C) $f^{-1}(x) = \sqrt[3]{x} + 5$ D) $f^{-1}(x) = \sqrt[3]{x} + 125$