Pre-Calc   Name __KEY__
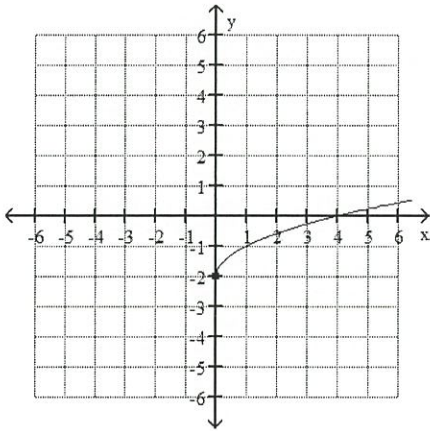
Practice Test – Chapter 1

YOU MUST SHOW ALL YOUR WORK TO RECEIVE CREDIT!

Use the graph to determine the function's domain and range.

1)

$D: [0, \infty)$

$R: [-2, \infty)$

1) _____

For questions 2 – 5, find the domain of the function.

2) $g(x) = \dfrac{3x}{x^2 - 81}$

$x^2 - 81 \neq 0$

$x \neq \pm 9$

2) $\begin{array}{l}(-\infty, -9) \cup \\ (-9, 9) \cup \\ (9, \infty)\end{array}$

3) $f(x) = \sqrt{6 - x}$

$6 - x \geq 0$

$6 \geq x$

3) $(-\infty, 6]$

4) $\dfrac{x}{\sqrt{x - 4}}$

$x - 4 > 0$

$x > 4$

4) $(4, \infty)$

5) $f(x) = \dfrac{1}{x - 2} + \dfrac{4}{x + 6}$

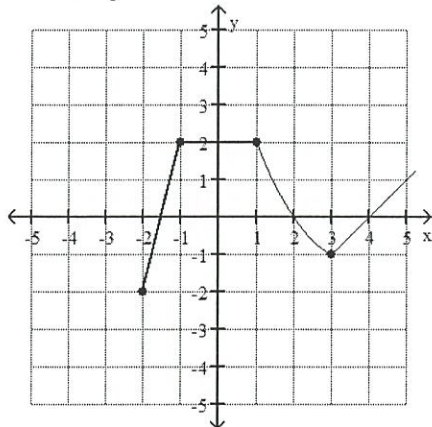$\dfrac{x + 6 + x - 2}{(x-2)(x+6)} = \dfrac{2x + 4}{}$

$x^2 + 4x - 12$ $x \neq 2, -6$

5) $\begin{array}{l}(-\infty, -6) \cup \\ (-6, 2) \cup \\ (2, \infty)\end{array}$

1

Identify the intervals where the function is changing as requested.

6) Increasing

6) $(-2,-1)$ $(3,\infty)$

$$y = 2x$$

Determine whether the given function is even, odd, or neither.

7) $f(x) = x^3 - 3x$

7) Odd

$-x^3 + 3x$

For questions 8, use the given conditions to write an equation for the line in slope–intercept form.

8) Passing through $(-4, -7)$ and $(-8, -5)$

8) $y = -\frac{1}{2}x - 9$

$$m = \frac{-5+7}{-8+4} = \frac{2}{-4} = -\frac{1}{2}$$

$$-5 = -\frac{1}{2}(-8) + b$$

$$-5 = 4 + b$$

$$-9 = b$$

For questions 9–10, given functions f and g, perform the indicated operations.

9) $f(x) = 7x - 9,$ $g(x) = 2x - 4$
   Find $f - g$.

9) $5x - 5$

$$7x - 9 - (2x - 4)$$

$$5x - 5$$

10) $f(x) = 2x^2 - 5x,$ $g(x) = x^2 - 3x - 10$
    Find $\frac{f}{g}$.

10) $\dfrac{2x^2 - 5x}{x^2 - 3x - 10}$

$$x(2x - 5) \qquad (x - 5)($$

For questions 11–12, for the given functions f and g , find the indicated composition.

11) $f(x) = \dfrac{4}{x + 6}$, $g(x) = \dfrac{7}{8x}$

$(f \circ g)(x)$

11) _____

$$\frac{4}{\frac{7}{8x} + 6} = \frac{4}{\frac{7 + 48x}{8x}} = \frac{32x}{4 + 48x} = \frac{32x}{7 + 48x}$$

12) $f(x) = x^2 + 2x - 2$, $g(x) = x^2 - 2x - 5$

$(f \circ g)(-4)$

12) _____397_____

$$(x^2 - 2x - 5)^2 + 2(x^2 - 2x - 5) - 2$$
$$(16 + 8 - 5)^2 + 2(16 + 8 - 5) - 2$$
$$361 + 38 - 2$$

For questions 13–14, find the domain of the composite function f ∘ g.

13) $f(x) = \dfrac{4}{x + 9}$, $g(x) = \dfrac{9}{x}$

$x \neq 0$

13) $(-\infty, -1) \cup$
    $(-1, 0) \cup (0, \infty$

$$\frac{4}{\frac{9}{x} + 9} = \frac{4}{\frac{9 + 9x}{x}} = \frac{4x}{9 + 9x} \qquad 9 + 9x \neq 0$$
$$9x \neq -9$$
$$x \neq -1$$

14) $f(x) = \sqrt{x}$; $g(x) = 5x + 25$

$x \geq 0$

14) $[-5, \infty)$

$$\sqrt{5x + 25}$$
$$5x + 25 \geq 0$$
$$5x \geq -25$$
$$x \geq -5$$

Solve the problem.

15) A discount warehouse offers two types of annual memberships. Plan A has an annual membership fee of $200 and the member pays 60% of the manufacturer's recommended list price. Plan B has an annual membership fee of $80 and the member pays 90% of the manufacturer's recommended list price. How many dollars of merchandise would a member have to purchase in a year to pay the same amount under both plans?

15) _____$400_____

A: $f(x) = 200 + .60x$
B: $g(x) = 80 + .90x$

$$200 + .60x = 80 + .90x$$
$$120 = .30x$$
$$400 = x$$

16) A kennel owner has 1200 feet of fencing to enclose a rectangular dog exercise pen. Express the area of the exercise pen, A, as a function of one of its dimensions, x.

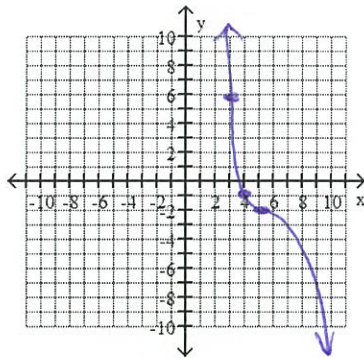16) $A = x(600 - x)$

$y = 600 - x$

$x \quad \boxed{} \quad x$
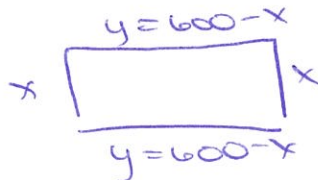
$y = 600 - x$

$$2x + 2y = 1200$$
$$2y = 1200 - 2x$$
$$y = 600 - x$$

Begin by graphing the standard cubic function $f(x) = x^3$. Then use transformations of this graph to graph the given function.

17) $g(x) = -(x - 5)^3 - 2$

17) _____

flip
right 5
down 2

x	1	2	3	4
$g(x)$	62	25	6	-1

Begin by graphing the standard quadratic function $f(x) = x^2$. Then use transformations of this graph to graph the given function.

18) $h(x) = (x - 2)^2$

18) _____

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