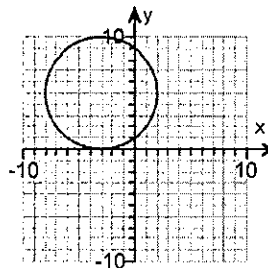


Student: _____	Instructor: Joe Bettters	Assignment: 1.5 / 5.1 Classwork
Date: _____	Course: Pre-Calculus Pre AP (Master Course)	

1. Determine the equation of the graph on the right.



The equation is _____.
(Simplify your answer. Type your answer in standard form.)

2. Earth is represented on a map of a portion of the solar system so that its surface is the circle with equation $x^2 + y^2 + 8x + 6y - 3575 = 0$. A weather satellite circles 0.9 unit above Earth with the center of its circular orbit at the center of Earth. Find the general form of the equation for the orbit of the satellite on this map.

The general form of the equation for the orbit of the satellite on this map is _____.
(Simplify your answer. Type an equation)

3. The line $x - 2y + 30 = 0$ is tangent to a circle at $(0, 15)$. The line $y = 2x + 6$ is tangent to the same circle at $(3, 12)$. Find the center of the circle.

The center of the circle is _____. (Type an ordered pair.)

4. For $f(x) = \frac{x}{x-7}$ and $g(x) = \frac{-9}{x}$, find the following composite functions and state the domain of each.

(a) $f \circ g$ (b) $g \circ f$ (c) $f \circ f$ (d) $g \circ g$

(a) $(f \circ g)(x) = \underline{\hspace{2cm}}$ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $f \circ g$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $f \circ g$ is all real numbers.

(b) $(g \circ f)(x) = \underline{\hspace{2cm}}$ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $g \circ f$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $g \circ f$ is all real numbers.

(c) $(f \circ f)(x) = \underline{\hspace{2cm}}$ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $f \circ f$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $f \circ f$ is all real numbers.

(d) $(g \circ g)(x) = \underline{\hspace{2cm}}$ (Simplify your answer.)

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The domain of $g \circ g$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $g \circ g$ is all real numbers.

5. If $f(x) = 7x^3 - 2x^2 + 7x - 3$ and $g(x) = 0$, find $(f \circ g)(x)$ and $(g \circ f)(x)$.

What is $(f \circ g)(x)$?

$(f \circ g)(x) = \underline{\hspace{2cm}}$

What is $(g \circ f)(x)$?

$(g \circ f)(x) = \underline{\hspace{2cm}}$

6. The price p of a certain product and the quantity x sold obey the demand equation shown.

$$p = -\frac{1}{4}x + 100, \quad 0 \leq x \leq 400$$

Suppose that the cost C of producing x units is $C = \frac{\sqrt{x}}{25} + 300$.

Assuming that all items produced are sold, find the cost C as a function of the price p .
[Hint: Solve for x in the demand equation and then form the composite.]

What is the cost C as a function of the price?

$C(p) =$ _____ (Simplify your answer.)

What are the restrictions on p in $C(p)$?

_____ $\leq p \leq$ _____

$$1. (x+3)^2 + (y-5)^2 = 25$$

$$2. x^2 + y^2 + 8x + 6y - 3683.81 = 0$$

$$3. (1, 13)$$

$$4. \frac{9}{9+7x}$$

A. The domain of $f \circ g$ is $\left\{ x \mid \underline{x \neq 0, x \neq -\frac{9}{7}} \right\}$.

(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

$$\frac{-9x + 63}{x}$$

A. The domain of $g \circ f$ is $\left\{ x \mid \underline{x \neq 0, x \neq 7} \right\}$.

(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

$$\frac{x}{-6x + 49}$$

A. The domain of $f \circ f$ is $\left\{ x \mid \underline{x \neq 7, x \neq \frac{49}{6}} \right\}$.

(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

x

A. The domain of $g \circ g$ is $\left\{ x \mid \underline{x \neq 0} \right\}$.

(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

$$5. -3$$

0

$$6. \frac{2\sqrt{100-p}}{25} + 300$$

0

100

Classwork 1.5, 5.1

① Center $(-3, 5)$

Radius = 5

$$(x-h)^2 + (y-k)^2 = r^2$$

$$(x+3)^2 + (y-5)^2 = 25$$

② $x^2 + y^2 + 8x + 6y - 3575 = 0$

$$x^2 + 8x + \boxed{16} + y^2 + 6y + \boxed{9} = 3575 + \boxed{16} + \boxed{9}$$

$$(x+4)^2 + (y+3)^2 = 3600$$

Center $(-4, -3)$, $r = 60$

* Satellite is .9 above, so $60 + .9$
 $= 60.9$

$$(x+4)^2 + (y+3)^2 = (60.9)^2$$

$$x^2 + y^2 + 8x + 6y - 3683.81 = 0$$

classwork

1.5, 5.1 continued

③ $x - 2y + 30 = 0$

tangent at $(0, 15)$

$y = 2x + 6$

tangent at $(3, 12)$

Equation 1

$y = \frac{1}{2}x + 15$

$\perp m = -2$

$y = mx + b$

$15 = -2(0) + b$

$b = 15$

$y = -2x + 15$

Equation 2

$y = 2x + 6$

$\perp m = -\frac{1}{2}$

$y = mx + b$

$12 = -\frac{1}{2}(3) + b$

$b = \frac{27}{2}$

$y = -\frac{1}{2}x + \frac{27}{2}$

$-2x + 15 = -\frac{1}{2}x + \frac{27}{2}$

$-1.5x = -1.5$

$x = 1$

$y = 13$

$(1, 13)$

$$\textcircled{4} \quad f(x) = \frac{x}{x-7} \quad g(x) = -\frac{9}{x}$$

$$A) (f \circ g)(x)$$

$$\frac{\left(-\frac{9}{x}\right)}{\left(-\frac{9}{x}\right) - 7} = \boxed{\frac{9}{9+7x}}$$

$$\boxed{x \neq 0, x \neq -\frac{9}{7}}$$

$$B) (g \circ f)(x)$$

$$\frac{-\frac{9}{x}}{\left(\frac{x}{x-7}\right)} = \boxed{\frac{-9x+63}{x}}$$

$$\boxed{x \neq 0, x \neq 7}$$

$$C) (f \circ f)(x)$$

$$\frac{\left(\frac{x}{x-7}\right)}{\left(\frac{x}{x-7}\right) - 7} = \boxed{\frac{x}{-6x+49}}$$

$$\boxed{x \neq 7, x \neq \frac{49}{6}}$$

$$D) (g \circ g)(x)$$

$$\frac{-\frac{9}{\left(-\frac{9}{x}\right)}}{\left(-\frac{9}{x}\right)} = \boxed{x}$$

$$\boxed{x \neq 0}$$

Classwork

1.5, 5.1

continued

$$\textcircled{5} \quad f(x) = 7x^3 - 2x^2 + 7x - 3$$

$$g(x) = 0$$

$$(f \circ g)(x) = 7(0)^3 - 2(0)^2 + 7(0) - 3$$

$$= \boxed{-3}$$

$$(g \circ f)(x) = \boxed{0}$$

$$\textcircled{6} \quad p = -\frac{1}{4}x + 100 \quad 0 \leq x \leq 400$$

$$C = \frac{\sqrt{x}}{25} + 300$$

$$p = -\frac{1}{4}x + 100$$

$$p - 100 = -\frac{1}{4}x$$

$$x = 4(100 - p)$$

$$C = \frac{\sqrt{4(100-p)}}{25} + 300$$

$$C = \frac{2\sqrt{100-p}}{25} + 300$$

$$0 \leq p \leq 100$$