

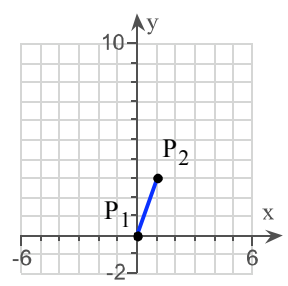
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Instructor: P Babaali
 Course: Math120 EGH Fall 2011
 Book: Sullivan: Precalculus, 9e

Assignment: Practice Exam II

1. Find the distance $d(P_1, P_2)$ between the given points P_1 and P_2 .

$P_1 = (0,0)$
 $P_2 = (1,3)$



$d(P_1, P_2) = \square$

(Simplify your answer. Type an exact answer, using radicals as needed.)

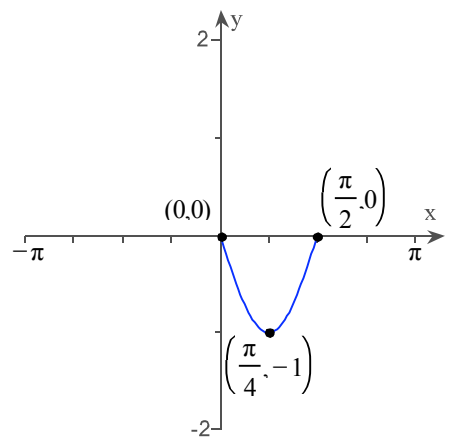
2. Solve the equation by factoring.

$x^2 - 49 = 0$

What is the solution set?

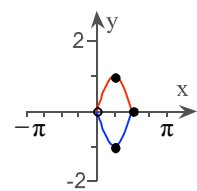
$\{\square\}$ (Use a comma to separate answers as needed.)

3. Draw a complete graph so that it has symmetry with respect to the origin.

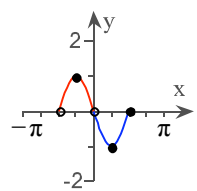


Choose the correct graph below.

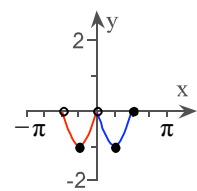
A.



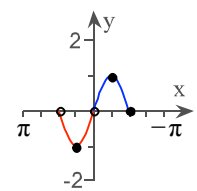
B.



C.



D.



4. Complete the sentence below.

The slope of a vertical line is _____; the slope of a horizontal line is _____.

The slope of a vertical line is ; the slope of a horizontal line is .

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5. Complete the sentence below.

The line $y = 3x + 4$ and $y = ax + 2$ are parallel if $a =$ _____.

The line $y = 3x + 4$ and $y = ax + 2$ are parallel if $a =$.

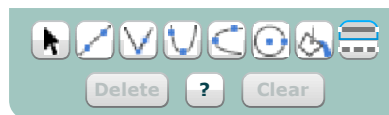
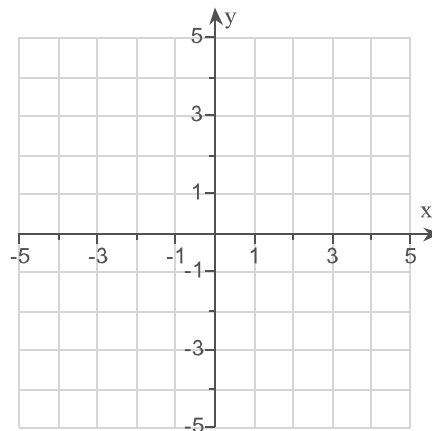
6. Plot the pair of points and determine the slope of the line containing them. Graph the line.

$(1, 1); (5, -4)$

What is the slope of the line containing the points $(1, 1)$ and $(5, -4)$? Select the correct choice below and fill in any answer boxes within your choice.

- A. The slope is .
- (Simplify your answer.)
- B. The slope is undefined.

Use the graphing tool to graph the line. Use the two given points when drawing the line.



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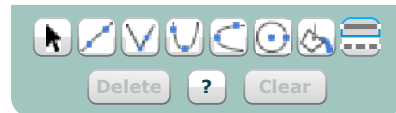
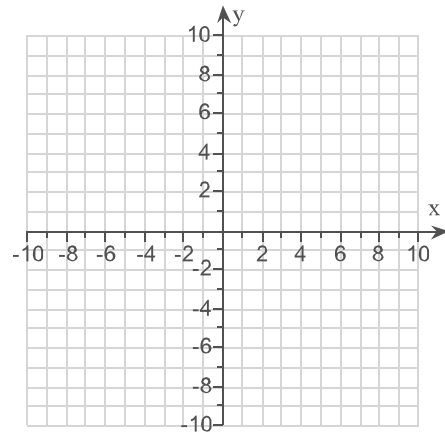
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7. Graph the line containing the point P and having slope m.

$$P = (1, -3); \text{ slope undefined}$$

Use the graphing tool to graph the line.



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8. A circle has the equation $7x^2 + 7y^2 - 42x - 28y - 84 = 0$. Graph the circle using the center (h,k) and radius r. Find the intercepts, if any, of the graph.

Use the graphing tool to graph the circle.



At what points do the x-intercepts occur? Select the correct choice below and fill in any answer boxes within your choice.

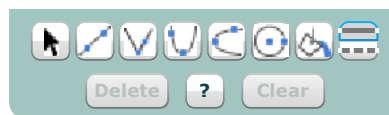
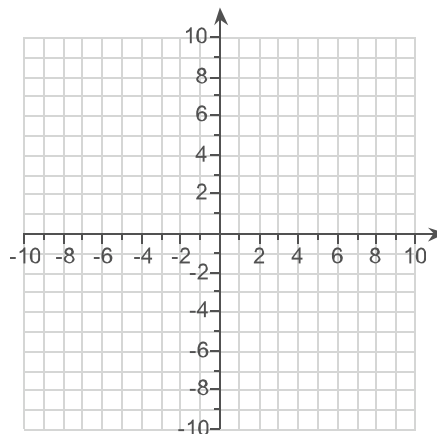
A. The x-intercept(s) is/are .
(Type an ordered pair. Use a comma to separate answers as needed. Type exact answers for each coordinate, using radicals as needed.)

B. There is no x-intercept.

At what points do the y-intercepts occur? Select the correct choice below and fill in any answer boxes within your choice.

A. The y-intercept(s) is/are .
(Type an ordered pair. Use a comma to separate answers as needed. Type exact answers for each coordinate, using radicals as needed.)

B. There is no y-intercept.



9. Determine whether the equation is a function.

$$y^2 = 8 - x^2$$

Is the equation a function?

Yes

No

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10. Find the domain of the function.

$$f(x) = \frac{2x}{\sqrt{x-8}}$$

The domain is .

(Type your answer in interval notation.)

11. For the given functions f and g , find the specified value of the following functions and state the domain of each one.

$$f(x) = x - 19; g(x) = 2x^2$$

(a) $(f + g)(3) =$

What is the domain of $f + g$?

- $\{x|x \geq 19\}$
- $\{x|x \neq 19 \text{ and } x \neq 0\}$
- $\{x|x \geq 0\}$
- $\{x|x \text{ is any real number}\}$

(b) $(f \cdot g)(2) =$

What is the domain of $f \cdot g$?

- $\{x|x \geq 19\}$
- $\{x|x \text{ is any real number}\}$
- $\{x|x \neq 19 \text{ and } x \neq 0\}$
- $\{x|x \geq 0\}$

12. Find the difference quotient of f ; that is, find $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$, for the following function.

Be sure to simplify.

$$f(x) = x^2 - 5x + 1$$

$$\frac{f(x+h) - f(x)}{h} =$$

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13.

If $q(n) = \frac{2n - 9}{n - A}$ and $q(-3) = 3$, what is the value of A?

A =

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14. Use the given graph of the function f to answer the following questions.

(a) Find $f(-14)$.

$$f(-14) = \square$$

(b) Find $f(-6)$.

$$f(-6) = \square$$

(c) Find $f(12)$.

$$f(12) = \square$$

(d) Is $f(-4)$ positive or negative?

Negative

Positive

(e) For what numbers x is $f(x) = 0$?

$$x = \square$$

(Use a comma to separate answers as needed.)

(f) What is the domain of f ?

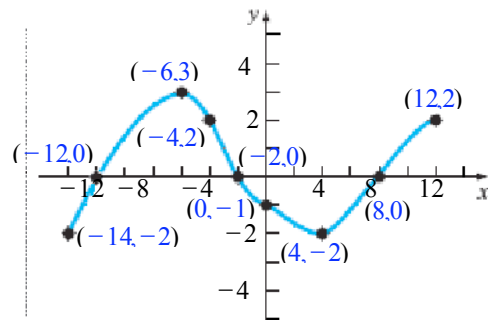
A. $[-2, 3]$

B. $(-14, 12)$

C. $[-14, 12]$

D. $(-\infty, \infty)$

(g) What is the range of f ?



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14. A. $(-\infty, \infty)$

(cont.) B. $[-14, 12]$

C. $[-2, 3]$

D. $(-2, 3)$

(h) What are the x-intercepts?

x =

(Use a comma to separate answers as needed.
Type an integer or a decimal.)

(i) What are the y-intercepts?

y =

(Use a comma to separate answers as needed.
Type an integer or a decimal.)

(j) For what numbers x is $f(x) = -2$?

x =

(Use a comma to separate answers as needed.)

(k) For what number x is $f(x) = 3$?

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15. Answer the questions about the following function.
- $$f(x) = 4x^2 - x - 3$$
- (a) Is the point $(-2, 15)$ on the graph of f ?
 - (b) If $x = -1$, what is $f(x)$? What point is on the graph of f ?
 - (c) If $f(x) = -3$, what is x ? What point(s) are on the graph of f ?
 - (d) What is the domain of f ?
 - (e) List the x -intercept(s), if any, of the graph of f .
 - (f) List the y -intercept, if any, of the graph of f .

- (a) Is the point $(-2, 15)$ on the graph of f ?
 - Yes
 - No
- (b) If $x = -1$, what is $f(x)$?
 $f(x) = \square$
Using this information, list a point on the graph of f .

(Type an ordered pair.)
- (c) If $f(x) = -3$, what is x ?
 $x = \square$
(Use a comma to separate answers as needed.)
Using this information, list the point(s) on the graph of f where $f(x) = -3$.

(Type an ordered pair. Use a comma to separate answers as needed.)
- (d) What is the domain of f ?
The domain is .
(Type your answer in interval notation.)
- (e) List the x -intercept(s), if any, of the graph of f . Select the correct choice below and fill in any answer boxes in your choice.
 - A.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
 - B. There are no x -intercepts.

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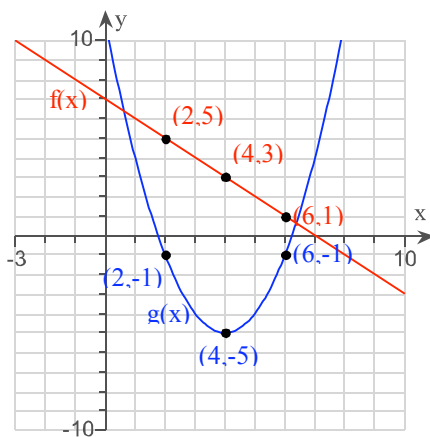
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15.
(cont.)

(f) List the y-intercept, if any, of the graph of f . Select the correct choice below and fill in any answer boxes in your choice.

- A.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There are no y-intercepts.

16. The graph of two functions, f and g , is illustrated below. Use the graph to answer parts (a) through (f).



(a) $(f + g)(2) = \square$
(Simplify your answer.)

(b) $(f + g)(4) = \square$
(Simplify your answer.)

(c) $(f - g)(6) = \square$
(Simplify your answer.)

(d) $(g - f)(6) = \square$
(Simplify your answer.)

(e) $(f \cdot g)(2) = \square$
(Simplify your answer.)

(f) $\left(\frac{f}{g}\right)(4) = \square$
(Simplify your answer.)

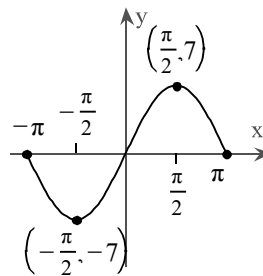
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17. Using the given graph of the function f , find the following.

- (a) The numbers, if any, at which f has a local maximum. What are these local maxima?
(b) The numbers, if any, at which f has a local minimum. What are these local minima?



(a) Find the value(s) of x at which f has a local maximum. Select the correct choice below and fill in any answer boxes in your choice.

- A. $x = \square$
(Type an exact answer, using π as needed. Use a comma to separate answers as needed.)
 B. There is no solution.

Find the local maximum. Select the correct choice below and fill in any answer boxes in your choice.

- A. \square
(Type an exact answer, using π as needed. Use a comma to separate answers as needed.)
 B. There is no solution.

(b) Find the value(s) of x at which f has a local minimum. Select the correct choice below and fill in any answer boxes in your choice.

- A. $x = \square$
(Type an exact answer, using π as needed. Use a comma to separate answers as needed.)
 B. There is no solution.

Find the local minimum. Select the correct choice below and fill in any answer boxes in your choice.

- A. \square
(Type an exact answer, using π as needed. Use a comma to separate answers as needed.)
 B. There is no solution.

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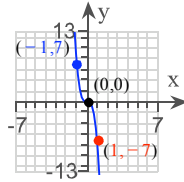
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18. Sketch the graph of the function. Be sure to label three points on the graph.

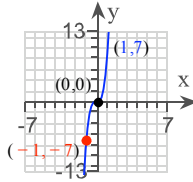
$$f(x) = \sqrt[3]{7x}$$

Choose the correct graph below.

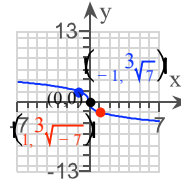
A.



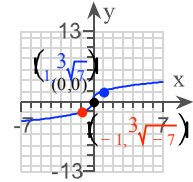
B.



C.



D.



19.

If $f(x) = \begin{cases} 2x - 1 & \text{if } -2 \leq x \leq 2 \\ x^3 - 2 & \text{if } 2 < x \leq 6 \end{cases}$, find: (a) $f(0)$, (b) $f(1)$, (c) $f(2)$, and (d) $f(6)$.

(a) $f(0) = \square$

(b) $f(1) = \square$

(c) $f(2) = \square$

(d) $f(6) = \square$

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20. The function f is defined as follows.

$$f(x) = \begin{cases} |2x| & \text{if } -2 \leq x < 0 \\ x^3 & \text{if } x > 0 \end{cases}$$

- (a) Find the domain of the function.
(b) Locate any intercepts.
(c) Graph the function.
(d) Based on the graph, find the range.
(e) Is f continuous on its domain?

(a) The domain of the function f is .
(Type your answer in interval notation.)

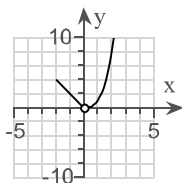
(b) Locate any intercepts. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The intercept(s) is/are .
(Type an ordered pair. Use a comma to separate answers as needed.)

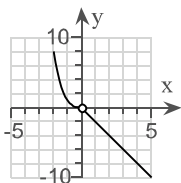
B. There are no intercepts.

(c) Choose the correct graph of the function below.

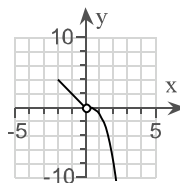
A.



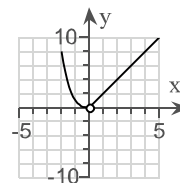
B.



C.



D.



(d) The range of the function f is .
(Type your answer in interval notation.)

(e) Is f continuous on its domain? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. Yes, f is continuous on its domain.

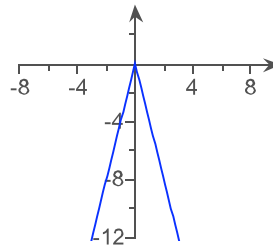
B. No, f is discontinuous at $x =$.
(Use a comma to separate answers as needed.)

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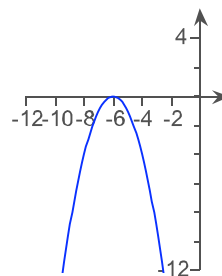
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21. Choose the function that matches the given graph.



- $y = 4|x|$
- $y = -4x^2$
- $y = -|x - 4|$
- $y = -4|x|$

22. Choose the function that matches the given graph.



- $y = -(x - 6)^2$
- $y = -x^2 + 6$
- $y = -(x + 6)^2$
- $y = -|x + 6|$

23. Write the function whose graph is the graph of $y = (x + 3)^2$, but is reflected about the y-axis.

$y = \square$

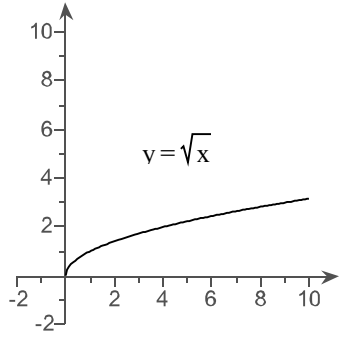
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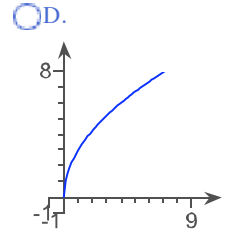
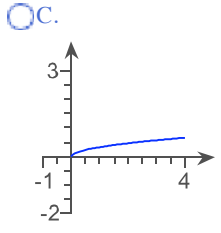
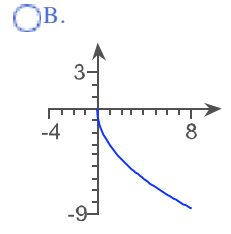
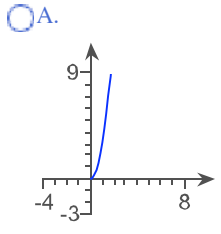
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24. Graph the function using the techniques of shifting, compressing, stretching, and/or reflecting. Start with the graph of the basic function shown below.

$$g(x) = 3\sqrt{x}$$



Choose the correct graph below.



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25. Answer the following for the given quadratic function.

$$f(x) = x^2 + 20x$$

(a) Does the graph of f open up or down?

- Up
 Down

(b) What is the vertex (h,k) of f ?

$(h,k) = \square$

(Simplify your answer. Type an ordered pair.)

(c) What is the axis of symmetry?

The axis of symmetry is \square .

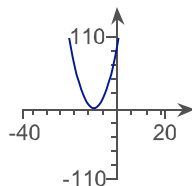
(Type an equation. Simplify your answer. Type any numbers as integers or fractions.)

(d) What are the intercepts? Select the correct choice below and fill in any answer boxes within your choice.

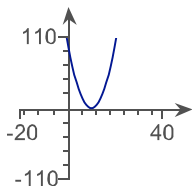
- A. The intercept(s) is/are \square .
(Type an ordered pair. Use a comma to separate answers as needed.)
- B. There are no intercepts.

(e) Which of the following is the graph of f ?

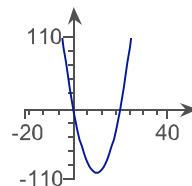
A.



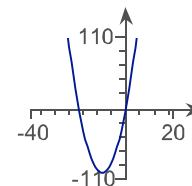
B.



C.



D.



(f) What is the domain of f ?

- $x^2 + 20x$ All positive numbers
 All real numbers $x(x + 20)$

(g) What is the range of f ?

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25. $\{y|y \geq -100\}$ $\{y|y \geq -10\}$
(cont.) $\{y|y \geq 10\}$ $\{y|y \geq 20\}$
- (h) On what interval is f increasing?
- $(10, \infty)$ $(20, \infty)$
 $(-100, \infty)$ $(-10, \infty)$
- (i) On what interval is f decreasing?
- $(-\infty, -100)$ $(-\infty, 10)$
 $(-\infty, -10)$ $(-\infty, 20)$

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1. $\sqrt{10}$

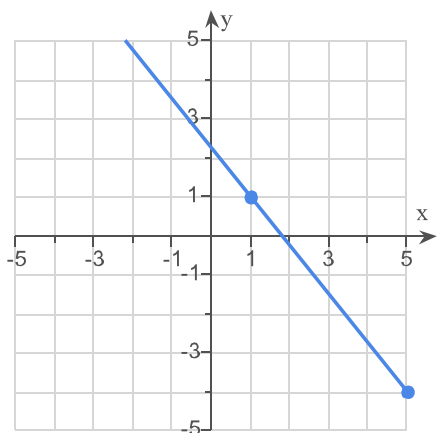
2. $-7, 7$

3. B

4. undefined
0.

5. 3

6. A, $-\frac{5}{4}$

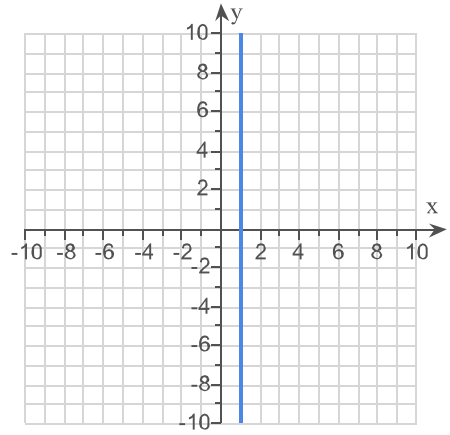


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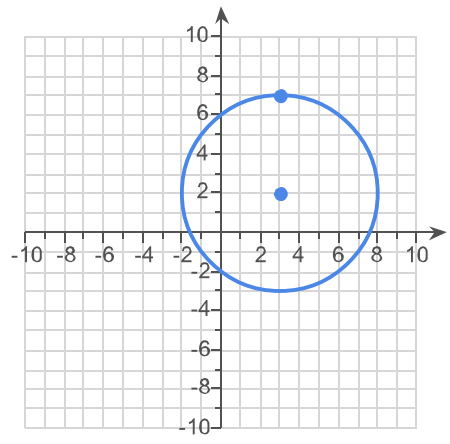
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7.



8.



A, $(3 - \sqrt{21}, 0), (3 + \sqrt{21}, 0)$
A, $(0, -2), (0, 6)$

9. the second choice

10. $(8, \infty)$

11. 2
the fourth choice
- 136
the second choice

12. $2x + h - 5$

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13. 2

14. -2
3
2
the second choice
-12, -2, 8
C
C
-12, -2, 8
-1
-14, 4
-6

15. the first choice
2
(-1, 2)
 $0, \frac{1}{4}$
 $(0, -3), \left(\frac{1}{4}, -3\right)$
 $(-\infty, \infty)$
A, $1, -\frac{3}{4}$
A, -3

16. 4
-2
2
-2
-5
 $-\frac{3}{5}$

17. A, $\frac{\pi}{2}$
A, 7
A, $-\frac{\pi}{2}$
A, -7

Student: _____
Date: _____
Time: _____

Instructor: P Babaali
Course: Math120 EGH Fall 2011
Book: Sullivan: Precalculus, 9e

Assignment: Practice Exam II

18. D

19. -1
1
3
214

20. $[-2,0) \cup (0,\infty)$
B
A
 $(0,\infty)$
B, 0

21. the fourth choice

22. the third choice

23. $(-x+3)^2$

24. D

25. the first choice
 $(-10, -100)$
 $x = -10$
A, $(0,0), (-20,0)$
D
the third choice
the first choice
the fourth choice
the third choice