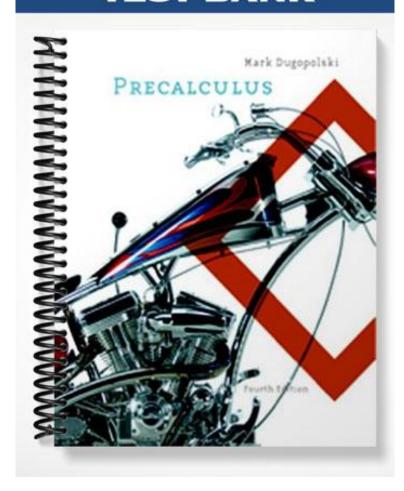
TEST BANK



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

1.
$$x - 3y = 2$$

2.
$$x = y^2 - 2y + 1$$

State the domain and range of each relation.

3.
$$y = |2x - 3|$$

4.
$$x = \sqrt{y+1}$$

Sketch the graph of each function.

5.
$$x + 2y = 4$$

6.
$$y = \sqrt{x-1}$$

7.
$$y = -(x-1)^2 - 2$$

8.
$$f(x) = \begin{cases} x+1, & \text{for } x < 2\\ 2-x, & \text{for } x \ge 2 \end{cases}$$

Let $f(x) = x^2 + x$ and g(x) = 2x + 1. Find and simplify each of the following expressions.

9.
$$f(4)$$

9.
$$f(4)$$
 10. $g^{-1}(x)$

11.
$$(f \circ g)(2)$$

12.
$$\frac{g(x+h)-g(x)}{h}$$

Solve each problem.

13. State the intervals on which $f(x) = (x+3)^2 - 1$ is increasing.

13. _____

14. Discuss the symmetry of the graph of the function $f(x) = x^3 - x$.

14. _____

15. State the solution set to the inequality $(x-1)^2 > 1$ using interval notation.

15. _____

16. Pete's Print Shop charges \$60 for printing 300 business cards and \$80 for printing 500 business cards. What is the average rate of change of the cost of printing as the number of cards goes from 300 to 500?

16. _____

17. The area of a rectangle is 30 square feet. Write the perimeter of this rectangle as a function of the length of one of its sides, x.

17. _____

18. The grade on Walker's math test varies directly with the number of hours he spends studying for the test. If he studies only 2 hours, he makes a 62. What will his score be if he studies for 3 hours?

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

1.
$$2x - 4y = 3$$

2.
$$x = |y|$$

State the domain and range of each relation.

3.
$$y = |2x| + 1$$

4.
$$x = y^2 - 1$$

Sketch the graph of each function.

5.
$$3x - y = 3$$

6.
$$y = \sqrt{x} + 2$$

7.
$$f(x) = \begin{cases} 1 - x, & \text{for } x < 1 \\ 2x + 1, & \text{for } x \ge 1 \end{cases}$$

8.
$$y = (x+2)^2 + 1$$

Let $f(x) = \sqrt{x+5}$ and g(x) = 5x+1. Find and simplify each of the following.

9.
$$f(4)$$

9.
$$f(4)$$
 10. $g^{-1}(x)$

11.
$$(f \circ g)(2)$$

11.
$$(f \circ g)(2)$$
 12. $\frac{g(x+h)-g(x)}{h}$

Solve each problem.

13. State the intervals on which $f(x) = (x-1)^2 + 2$ is increasing.

13. _____

14. Discuss the symmetry of the graph of the function $f(x) = x^3 - x^2$.

14. _____

15. State the solution set to the inequality $(x+1)^2 < 1$ using interval notation.

15. _____

16. Pete's Print Shop charges \$50 for printing 500 business cards and \$90 for printing 1000 business cards. What is the average rate of change of the cost of printing as the number of cards goes from 500 to 1000?

16. _____

17. The perimeter of a rectangle is 10 square feet. Write the area of this rectangle as a function of the length of one of its sides, x.

17.

18. The grade on Walker's math test varies directly with the number of hours he spends studying for the test. If he studies only 2 hours, he makes a 50. What will his score be if he studies for 3 hours?

Determine whether each relation defines y as a function of x.

2.
$$x^2 + y^2 = 1$$

State the domain and range of each relation.

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

4.
$$f(x) = \begin{cases} -2x - 3, & for \ x < 0 \\ x + 1, & for \ x > 0 \end{cases}$$

Sketch the graph of each function.

5.
$$y = \frac{2}{3}x - 1$$

6.
$$y = (x+2)^2 - 1$$

7.
$$y = |x| - 3$$

8.
$$y = \sqrt{16 - x^2}$$

Let $f(x) = 2x^2 - x + 1$ and $g(x) = \sqrt{5 - x}$. Find and simplify each of the following.

9.
$$g(-19)$$

10.
$$g^{-1}(x)$$

11.
$$(f \circ g)(4)$$

9.
$$g(-19)$$
 10. $g^{-1}(x)$ **11.** $(f \circ g)(4)$ **12.** $\frac{f(x+h)-f(x)}{h}$

Solve each problem.

13. State the intervals on which f(x) = |x-2| + 3 is increasing.

13. _____

14. Let f(x) = x - 2, $g(x) = x^2$ and h(x) = x - 1. Write $m(x) = x^2 - 2x + 1$ as a composition of appropriate functions chosen from f, g, and h.

14. _____

15. State the solution set to the inequality $(x+1)^2 < 1$ using interval notation.

15. _____

16. Jane's Advertising charges \$500 for 1200 flyers and \$780 for 1600 flyers. What is the average rate of change of the cost of the advertising as the number of flyers goes from 1200 to 1600?

16. _____

17. Write the area of a square as a function of the length of one of its diagonals, d.

17.

18. The cost of constructing a 5-foot by 7-foot deck is \$192.50. If the cost varies jointly as the length and width, then what does an 8-foot by 10-foot deck cost?

8. _____

Determine whether each relation defines y as a function of x.

1.
$$\{(3,2), (2,3), (1,3)\}$$

2.
$$x^2 + y = 5$$

State the domain and range of each relation.

3.
$$y = \sqrt{4 - x^2}$$

4.
$$g(x) = \begin{cases} x - 1, & \text{for } x > 3 \\ 2x - 7, & \text{for } x < 3 \end{cases}$$

Sketch the graph of each function.

5.
$$y = -\frac{1}{3}x$$

6.
$$y = -(x-3)^2 + 1$$

7.
$$y = x^2 + 3$$

8.
$$y = \sqrt{25 - x^2}$$

Let $f(x) = x^2 + x$ and g(x) = 2x + 1. Find and simplify each of the following. 9. (f+g)(2) 10. $g^{-1}(x)$ 11. $(f \circ g)(-1)$ 12. $\frac{f(x+h)-f(x)}{h}$

9.
$$(f+g)(2)$$

10.
$$g^{-1}(x)$$

11.
$$(f \circ g)(-1)$$

12.
$$\frac{f(x+h)-f(x)}{h}$$

32

Solve each problem.

13. State the intervals on which $f(x) = 2 - x^2$ is increasing.

13.

14. Let $f(x) = (x-3)^{-1/2}$, g(x) = 2x + 3 and $h(x) = \sqrt{2x}$. Write $m(x) = \frac{1}{\sqrt{2x}}$ as a composition of appropriate functions chosen from f, g, and h.

14. _____

15. State the solution set to the inequality $(x+4)^2 < 1$ using interval notation.

15. _____

16. Jane's Advertising charges \$500 for 1200 flyers and \$820 for 1600 flyers. What is the average rate of change of the cost of the advertising as the number of flyers goes from 1200 to 1600?

16.

17. Write the area of a square as a function of the length of one of its diagonals, d.

17. _____

18. The cost of constructing a 5-foot by 7-foot deck is \$148.75. If the cost varies jointly as the length and width, then what does an 8-foot by 10-foot deck cost?

18. _____

Multiple Choice: Choose the best answer for each of the following.

Which of the following define y as a function of x? 1.

A.
$$y = |x - 2| + 1$$

$$C. x = 2$$

E.
$$x = |y|$$

B.
$$4x - 2y = 3$$

D.
$$x^2 + y^2 = 4$$

F.
$$x^3 + y = 2$$

What is the domain of the relation: $y = \sqrt{x+1}$? 2.

a.
$$[-1, \infty)$$

b.
$$[0, \infty)$$

b.
$$[0, \infty)$$
 c. $[1, \infty)$

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

Find x, if $f(x) = \sqrt{x-3}$ and f(x) = 3.

- a. 0
- b. 12
- c. undefined
- d. 6

Determine the range of $f(x) = \begin{cases} x+1, & \text{for } x \geq 0 \\ -x+2, & \text{for } x < 0 \end{cases}$

- a. $[1, \infty)$
- b. $(-\infty, \infty)$ c. $(-\infty, 0) \cup (0, \infty)$
- d. [1, 2)

Explain how to use the graph of $y = x^2$ to get the graph of $y = (x+2)^2$. ____ 5.

- Translate 2 units left a.
- Translate 2 units right c.
- b. Translate 2 units down
- d. Translate 2 units up

Solve the inequality $|x-1|-2 \le 0$ by using its graph. 6.

- a. $(-\infty, 3]$ b. [-1, 3] c. $(-\infty, -1] \cup [3, \infty)$ d. $[3, \infty)$

Find the domain of f + g if $f = \{(-1, 0), (-2, 4), (3, 6)\}$ 7. and $g = \{(-1, 0), (0, 5), (3, 2)\}.$

- a. $\{-1, 3\}$ b. $\{-1, -2, 0, 3\}$ c. $\{-1, 0, 3\}$ d. $\{-1, -2, 3\}$

If $f(x) = x^2 - 1$ and g(x) = x + 1, find $\left(\frac{f}{g}\right)(-1)$. 8.

- a. 0
- b. -2
- c. -x-1
- d. undefined

9. The area of a rectangle is 20 square feet. Write the perimeter of this rectangle as a function of the length of one of its sides, x.

> $P = 2x + 2(\frac{20}{x})$ a.

- c. P = 2x + 2y 20
- a. $P = 2x + 2(\frac{20}{x})$ b. P = 2x + 2(10 x)
- d. P = 2x + 2y

 10.	Use f^{-1} t	o find tl	he range	of $f(x)$	=	$\frac{2x-1}{x+3}$

- $(-\infty,-3)\cup(-3,\infty)$

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

c. $(-\infty, 2) \cup (2, \infty)$ d. $(-\infty, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$

11. Express the radius of a circle, r, as a function of its circumference C, given $C = \pi d$, where d is the diameter of the circle.

- a. $r = \frac{C}{2\pi}$ b. $C = \pi r^2$ c. $r = \sqrt{\frac{C}{\pi}}$ d. $r = \frac{C}{\pi}$

___ 12. Find the constant of variation for the following: c varies inversely as the square of t and c = 4 when t = 5.

- a. 20
- b. 100
- c. $\frac{5}{4}$

d. $\frac{25}{4}$

Write a formula with the appropriate variation constant that describes the 13. variation of the length of a building in yards (y) with the length of a building in inches (n).

- a. y = 36n b. $n = \frac{36}{y}$ c. $y = \frac{36}{n}$ d. n = 36y

Find $(f \circ g)(x)$ if $f(x) = x^2 - 1$ and g(x) = 3x + 5. 14.

- a $3x^2 + 2$
- b. $3x^2 + 10x + 8$ c. $9x^2 + 30x + 24$ d. $-\frac{4}{3}$ and -3

15. If a function is even, then it is:

> level a.

- symmetric to the x-axis c.

not invertible b.

d. symmetric to the origin

If $g(x) = \frac{x-1}{2x+3}$, find $g^{-1}(x)$. 16.

- a. $\frac{3x+1}{1-2x}$ b. $\frac{2x+3}{x-1}$
- c. 2xy + 3x + 1 d. $\frac{3x+1}{-2x}$

Determine the symmetry of the graph of $f(x) = x^3 + 4x$. **17.**

- a. Symmetric to the *y*-axis
- c. Symmetric to the origin

Symmetric to x = 4

d. No symmetry

____ 18. Jane's Advertising charges \$500 for 1200 flyers and \$780 for 1800 flyers. What is the average rate of change of the cost of the advertising as the number of flyers goes from 1200 to 1800?

- a. \$280.00
- b. \$0.23
- c. \$0.16
- d. \$0.47

Multiple Choice: Choose the best answer for each of the following.

Which of the following define y as a function of x? ____ 1.

A.
$$y = |x - 2| + 1$$

C.
$$x = 2$$

D. $x^2 + y^2 = 4$

E.
$$x = |y|$$

B.
$$4x - 2y = 3$$

D.
$$x^2 + y^2 = 4$$

E.
$$x = |y|$$

F. $x^3 + y = 2$

What is the domain of the relation: $y = \sqrt{x-1}$? __ 2.

a.
$$[-1, \infty)$$

b.
$$[0, \infty)$$

b.
$$[0, \infty)$$
 c. $[1, \infty)$

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

Find x, if $f(x) = \sqrt{x-4}$ and f(x) = 3. 3.

- a. 13
- b. 0

- c. undefined
- d. 7

Determine the range of $f(x) = \begin{cases} x+1, & \text{for } x \geq 0 \\ -x+2, & \text{for } x < 0 \end{cases}$

- a. [1, 2)
- b. $(-\infty, \infty)$ c. $(-\infty, 0) \cup (0, \infty)$
- $d.[1,\infty)$

Explain how to use the graph of $y = x^2$ to get the graph of $y = x^2 - 2$. __ 5.

- Translate 2 units left a.
- Translate 2 units right c.
- b. Translate 2 units down
- d. Translate 2 units up

6. Solve the inequality $|x+2|-1 \le 0$ by using its graph.

- a. $(-\infty, -1]$ b. [1, 3]
- c. $(-\infty, -3] \cup [1, \infty)$ d.[-3, -1]

Find the domain of f + g if $f = \{(-1, 0), (-2, 4), (3, 6)\}$ 7. and $g = \{(-1, 0), (0, 5), (3, 2)\}.$

- a. $\{-1, -2, 3\}$ b. $\{-1, -2, 0, 3\}$ c. $\{-1, 0, 3\}$ d. $\{-1, 3\}$

If $f(x) = x^2 - 1$ and g(x) = x + 1, find $\left(\frac{f}{g}\right)(-1)$. 8.

a. 0

- b. -2
- c. undefined
- d. -x-1

9. The area of a rectangle is 20 square feet. Write the perimeter of this rectangle as a function of the length of *one* of its sides, x.

- P = 2x + 2(10 x)a.
- c. P = 2x + 2y

b. $P = 2x + 2(\frac{20}{x})$

d. P = 2x + 2y - 20

	10.	Use f^{-1} t	o find	the range	of $f(x) =$	$=\frac{3x-1}{x+2}$	•
--	-----	----------------	--------	-----------	-------------	---------------------	---

a. $(-\infty, 3) \cup (3, \infty)$

b. $(-\infty, 0) \cup (0, \infty)$

c. $(-\infty, 2) \cup (2, \infty)$ d. $(-\infty, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$

11. Express the radius of a circle, r, as a function of its circumference C, given $C = \pi d$, where d is the diameter of the circle.

- a. $r = \sqrt{\frac{C}{\pi}}$ b. $C = \pi r^2$ c. $r = \frac{C}{2\pi}$ d. $r = \frac{C}{\pi}$

Find the constant of variation for the following: c varies inversely as the ___ 12. square of t and c = 4 when t = 5.

- a. 100
- b. 20
- c. $\frac{5}{4}$

d. $\frac{25}{4}$

Write a formula with the appropriate variation constant that describes the 13. variation of the length of a building in yards (y) with the length of a building in inches (n).

- a. $n = \frac{36}{y}$ b. $y = \frac{36}{y}$ c. n = 36y d. y = 36n

Find $(f \circ g)(x)$ if $f(x) = x^2 - 1$ and g(x) = 3x + 5. 14.

- a $3x^2 + 2$
- b. $9x^2 + 30x + 24$ c. $3x^2 + 10x + 8$ d. $-\frac{4}{3}$ and -3

15. If a function is even, then it is:

a. level

c. not invertible

b. symmetric to the x-axis

d. symmetric to the origin

____ 16. If $g(x) = \frac{x-1}{2x+3}$, find $g^{-1}(x)$.

- a. $\frac{2x+3}{x-1}$ b. $\frac{3x+1}{1-2x}$
- c. 2xy + 3x + 1 d. $\frac{3x+1}{-2x}$

Determine the symmetry of the graph of $f(x) = x^2 + 4x$. **17.**

- a. Symmetric to the *y*-axis
- c. Symmetric to the origin
- Symmetric to x = -2
- d. No symmetry

____ 18. Jane's Advertising charges \$500 for 1200 flyers and \$780 for 1800 flyers. What is the average rate of change of the cost of the advertising as the number of flyers goes from 1200 to 1800?

- a. \$0.16
- b. \$0.47
- c. \$280.00
- d. \$0.23