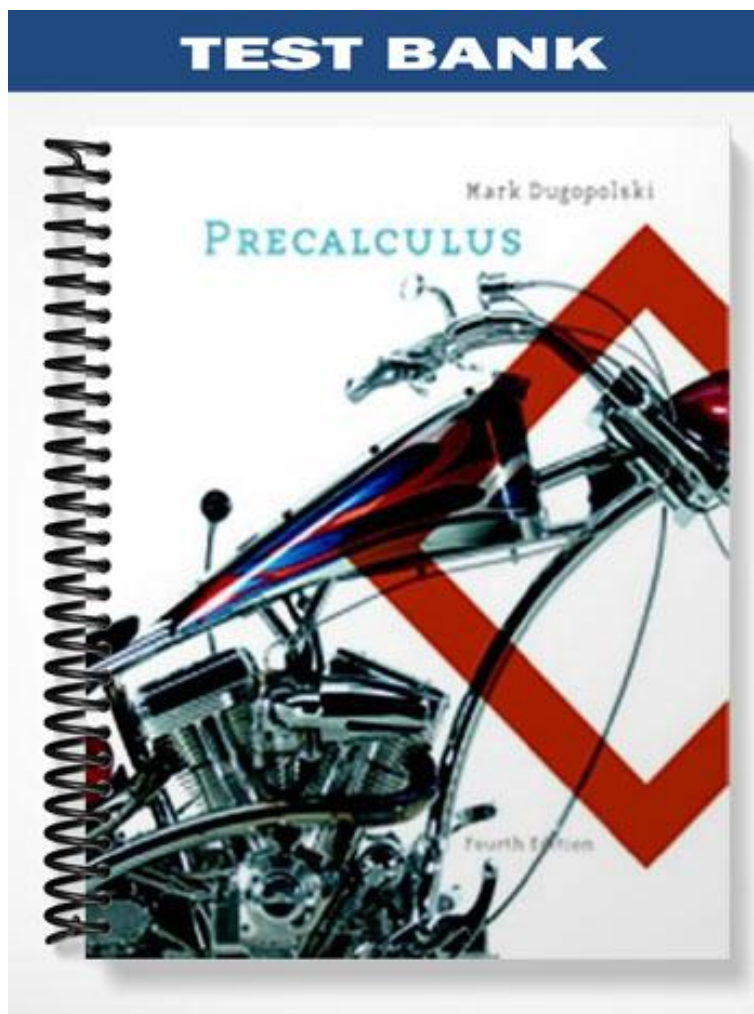


**TEST BANK**



Name: \_\_\_\_\_

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

1.  $x - 3y = 2$

1. \_\_\_\_\_

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

2. \_\_\_\_\_

State the domain and range of each relation.

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

3. domain: \_\_\_\_\_  
range: \_\_\_\_\_

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

4. domain: \_\_\_\_\_  
range: \_\_\_\_\_

Sketch the graph of each function.

5.  $x + 2y = 4$

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

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

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

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

9.  $f(4)$

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

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

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

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

**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?

18. \_\_\_\_\_

Name: \_\_\_\_\_

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

1.  $2x - 4y = 3$

2.  $x = |y|$

1. \_\_\_\_\_

2. \_\_\_\_\_

State the domain and range of each relation.

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

4.  $x = y^2 - 1$

3. domain: \_\_\_\_\_  
range: \_\_\_\_\_

4. domain: \_\_\_\_\_  
range: \_\_\_\_\_

Sketch the graph of each function.

5.  $3x - y = 3$

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

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

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.  $f(4)$

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

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

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

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

**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?

18. \_\_\_\_\_

Name: \_\_\_\_\_

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

1.  $\{(3, 1), (2, 4), (3, 2)\}$

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

1. \_\_\_\_\_

2. \_\_\_\_\_

State the domain and range of each relation.

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

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

3. domain: \_\_\_\_\_  
range: \_\_\_\_\_

4. domain: \_\_\_\_\_  
range: \_\_\_\_\_

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

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

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

**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?

18. \_\_\_\_\_

Name: \_\_\_\_\_

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

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

1. \_\_\_\_\_

2.  $x^2 + y = 5$

2. \_\_\_\_\_

State the domain and range of each relation.

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

3. domain: \_\_\_\_\_  
range: \_\_\_\_\_

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

4. domain: \_\_\_\_\_  
range: \_\_\_\_\_

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. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_



**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. \_\_\_\_\_







- \_\_\_\_\_ 10. Use  $f^{-1}$  to find the range of  $f(x) = \frac{3x-1}{x+2}$ .
- a.  $(-\infty, 3) \cup (3, \infty)$                       c.  $(-\infty, 2) \cup (2, \infty)$   
b.  $(-\infty, 0) \cup (0, \infty)$                       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.  $r = \frac{C}{\pi}$
- \_\_\_\_\_ 12. Find the constant of variation for the following:  $c$  varies inversely as the square of  $t$  and  $c = 4$  when  $t = 5$ .
- a. 100                      b. 20                      c.  $\frac{5}{4}$                       d.  $\frac{25}{4}$
- \_\_\_\_\_ 13. Write a formula with the appropriate variation constant that describes the 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.  $y = \frac{36}{n}$                       c.  $n = 36y$                       d.  $y = 36n$
- \_\_\_\_\_ 14. Find  $(f \circ g)(x)$  if  $f(x) = x^2 - 1$  and  $g(x) = 3x + 5$ .
- 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.  $\frac{3x+1}{-2x}$
- \_\_\_\_\_ 17. Determine the symmetry of the graph of  $f(x) = x^2 + 4x$ .
- a. Symmetric to the  $y$ -axis                      c. Symmetric to the origin  
b. 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