

For items 1 – 2, evaluate each if  $f(x) = x^2 - 3x + 1$ .

1.  $f(-4) = 29$

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

3. Find the domain of  $y = \frac{x^2 - 16}{x - 4}$  in interval notation.

- A.  $(-\infty, \infty)$
- B.  $(-\infty, 4] \cup [4, \infty)$
- C.  $(-\infty, 4) \cup (4, \infty)$
- D.  $(-4, 4)$

4. Find the domain of  $y = \sqrt{2x + 3}$  in interval notation.

- A.  $(-\infty, \infty)$
- B.  $[-1.5, \infty)$
- C.  $(-\infty, -1.5]$
- D.  $(-1.5, \infty)$

5. Find the domain of  $y = \frac{1}{\sqrt{3x}}$  in interval notation.

- A.  $(-\infty, \infty)$
- B.  $(0, \infty)$
- C.  $[0, \infty)$
- D.  $(-\infty, 0) \cup (0, \infty)$

6. Find the range of  $y = x^3$  in interval notation.

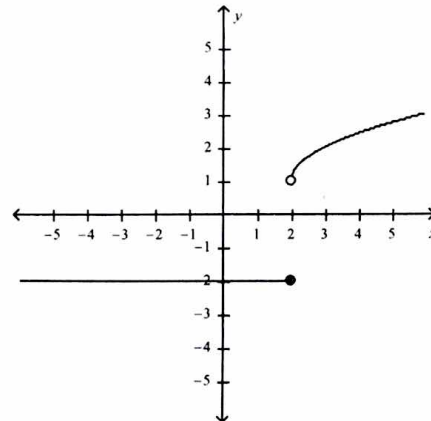
- A.  $(-\infty, \infty)$
- B.  $(0, \infty)$
- C.  $[0, \infty)$
- D.  $(-\infty, 0) \cup (0, \infty)$

7. Find the range of  $y = 3^x$  in interval notation.

- A.  $(-\infty, \infty)$
- B.  $(0, \infty)$
- C.  $[0, \infty)$
- D.  $(-\infty, 0) \cup (0, \infty)$

8. For the figure at the right, find  $\lim_{x \rightarrow 2^-} f(x)$ .

- A. -2
- B. 1
- C. 2
- D. The limit does not exist.



9. For the figure at the right, find  $\lim_{x \rightarrow 2} f(x)$ .

- A. -2
- B. 1
- C. 2
- D. The limit does not exist.

10. Find  $\lim_{x \rightarrow -3} \frac{x^2 - 9}{x^3 + 27}$ .

- A. 0  
B.  $\infty$

C.  $-\frac{2}{9}$

D. The limit does not exist.

11. Find  $\lim_{x \rightarrow 3} \frac{-2}{(x-3)^2}$

- A. 0  
B.  $\infty$   
 C.  $-\infty$

D. The limit does not exist.

12. Find  $\lim_{x \rightarrow 0} \frac{(\sqrt{16+x} - 4)}{x}$       0.125 or  $\frac{1}{8}$

13. Describe the discontinuities of the function  $f(x) = \frac{x+5}{x^2+5x} = \frac{x+5}{x(x+5)}$

$x=0$  VA  
 $x=-5$  hole

14. Describe the discontinuities of the function  $f(x) = \frac{x+2}{x^2+7x+10} = \frac{x+2}{(x+2)(x+5)}$

$x=-2$  hole  
 $x=-5$  VA

Find the derivative of each function.

15.  $f(x) = 7x^2 + 3x - 2$        $f'(x) = 14x + 3$

16.  $f(x) = 2x^{\frac{1}{2}}$        $f'(x) = x^{-\frac{1}{2}} = \frac{1}{x^{\frac{1}{2}}}$

17.  $f(x) = \frac{3-x}{2x+1}$        $f'(x) = \frac{-7}{(2x+1)^2}$

18.  $f(x) = (4x^2 + 5)^6$

$48(4x^2 + 5)^5$

19. Find the equation of line tangent to the graph of  $f(x) = x^3 - 2x^2$  at the point (3, 9).

A.  $y = -4x + 1$

B.  $y = 4x - 8$

C.  $y = 15x + 54$

D.  $y = 15x - 36$

20. The position for an object is given by  $s(t) = 2t^2 - 6t - 4$ , measure in feet with time in seconds.

Find the instantaneous velocity when  $t = 3$ .

A. 6 ft/sec

B. -4 ft/sec

C. 4 ft/sec

D. 10 ft/sec