

Practice TEST: Precal -- Domain, Range, discontinuities, end-behavior, & symmetry  
 Calculator permitted

Part I: MULTIPLE CHOICE (USE CAPITAL LETTERS)

Solve the equation graphically.

1)  $|4x - 3| = 2 - |x - 1|$  1) \_\_\_\_\_  
 A) -2                                      B) 1.2                                      C) 0.4 ; 1.2                                      D) 0.4

2)  $6\sqrt{x} + x = 3$  2) \_\_\_\_\_  
 A)  $-21 \pm 12\sqrt{3}$                                       B)  $21 \pm 12\sqrt{3}$                                       C)  $21 - 12\sqrt{3}$                                       D)  $221 \pm 212\sqrt{3}$

Find the domain of the given function.

3)  $f(x) = \sqrt{14 - x}$  3) \_\_\_\_\_  
 A) All real numbers                                      B)  $(-\infty, 14]$   
 C)  $(\sqrt{14}, \infty)$                                       D)  $(-\infty, 14) \cup (14, \infty)$

4)  $f(x) = \frac{(x+2)(x-2)}{x^2+4}$  4) \_\_\_\_\_  
 A)  $(-\infty, -4) \cup (-4, 4) \cup (4, \infty)$                                       B) All real numbers  
 C)  $(-\infty, 2) \cup (-2, 2) \cup (2, \infty)$                                       D)  $(4, \infty)$

5)  $f(x) = \frac{\sqrt{x+9}}{(x+4)(x-8)}$  5) \_\_\_\_\_  
 A)  $(-\infty, -9) \cup (-9, -4) \cup (-4, 8) \cup (8, \infty)$                                       B)  $(0, \infty)$   
 C)  $[-9, -4) \cup (-4, 8) \cup (8, \infty)$                                       D) All real numbers

6)  $f(x) = \sqrt{20 - x}$  6) \_\_\_\_\_  
 A)  $(-\infty, 20]$                                       B) All real numbers  
 C)  $(\sqrt{20}, \infty)$                                       D)  $(-\infty, 20) \cup (20, \infty)$

7)  $f(x) = \sqrt{x^2 + 55}$  7) \_\_\_\_\_  
 A)  $[7.41619849, \infty)$                                       B)  $(7.41619849, \infty)$   
 C)  $(-\infty, 55) \cup (55, \infty)$                                       D)  $(-\infty, \infty)$

8)  $f(x) = \frac{\sqrt{9 - x^2}}{x - 1}$  8) \_\_\_\_\_  
 A)  $[-3, 3]$                                       B)  $[-9, 1) \cup (1, 9]$                                       C)  $[-3, 1) \cup (1, 3]$                                       D)  $(-\infty, -3) \cup (3, \infty)$

9)  $f(x) = -6$  9) \_\_\_\_\_  
 A) All real numbers                                      B)  $[0, \infty)$   
 C)  $(-\infty, -6) \cup (-6, \infty)$                                       D)  $[-6, 6]$

Find the range of the function.

10)  $f(x) = (x + 1)^2 + 7$  10) \_\_\_\_\_  
 A)  $(-\infty, \infty)$                                       B)  $(7, \infty)$                                       C)  $(-7, \infty)$                                       D)  $[7, \infty)$

11)  $f(x) = \frac{7}{12 - x}$  11) \_\_\_\_\_  
 A)  $(-\infty, 12) \cup (12, \infty)$  B)  $(-\infty, 0) \cup (0, \infty)$   
 C)  $(-\infty, \infty)$  D)  $(0, \infty)$

12)  $f(x) = 3 + \sqrt{8 - x}$  12) \_\_\_\_\_  
 A)  $[3, \infty)$  B)  $(-\infty, 3]$  C)  $(-\infty, \infty)$  D)  $[8, \infty)$

Determine algebraically whether the function is even, odd, or neither even nor odd.

13)  $f(x) = 0.74x^2 + |x| - 5$  13) \_\_\_\_\_  
 A) Odd B) Neither C) Even

14)  $f(x) = 13\sqrt[3]{x}$  14) \_\_\_\_\_  
 A) Even B) Neither C) Odd

15)  $f(x) = x + \frac{5}{x}$  15) \_\_\_\_\_  
 A) Even B) Odd C) Neither

Find the asymptote(s) of the given function.

16)  $h(x) = \frac{(x - 1)(x + 5)}{x^2 - 4}$  vertical asymptotes(s) 16) \_\_\_\_\_  
 A)  $x = -1, x = 5$  B) None C)  $x = 1, x = -5$  D)  $x = 2, x = -2$

17)  $f(x) = \frac{x - 4}{x^2 + 8}$  vertical asymptotes(s) 17) \_\_\_\_\_  
 A)  $x = -8$  B)  $x = 2, x = -2$  C)  $x = 8$  D) None

18)  $f(x) = \frac{3x^2 + 9}{3x^2 - 9}$  horizontal asymptotes(s) 18) \_\_\_\_\_  
 A)  $y = -9$  B) None C)  $y = 9$  D)  $y = 1$

19)  $g(x) = \frac{x^2 + 3x - 4}{x - 4}$  horizontal asymptotes(s) 19) \_\_\_\_\_  
 A) None B)  $y = -3$  C)  $y = 4$  D)  $y = 2$

20)  $f(x) = 1.7^x$  horizontal asymptotes(s) 20) \_\_\_\_\_  
 A)  $y = 0$  B)  $y = 1.7$  C)  $x = 0$  D) None

Free Response. Show all work below the line. Show all work.

21)

If  $f(x) = \frac{6x^3 - 6x}{2x(x^2 - 16)}$ , answer the following

- Find the domain of  $f(x)$ . Use proper notation.
- Find any  $x$ -intercepts
- Find the name and location of any discontinuities.
- Find  $\lim_{x \rightarrow \infty} f(x)$
- Find  $\lim_{x \rightarrow -\infty} f(x)$
- Give the equation of any Horizontal Asymptotes
- Determine algebraically if  $f(x)$  is even, odd, or neither.

22)

If  $f(x) = \frac{6x}{\sqrt{9x^2 + 1}}$ , answer the following

- Find the domain of  $f(x)$ . Use proper notation.
- Find any  $x$ -intercepts
- Find the name and location of any discontinuities.
- Find  $\lim_{x \rightarrow \infty} f(x)$
- Find  $\lim_{x \rightarrow -\infty} f(x)$
- Give the equation of any Horizontal Asymptotes
- Determine algebraically if  $f(x)$  is even, odd, or neither.