

Precal Practice Test 2.6-2.8

_____ 1. The graph of $f(x) = \frac{2x^2 - 3x}{x+1}$ has an asymptote at:
 (A) $y = -1$ (B) $y = 2x + 5$ (C) $x = 0$ (D) $y = x$ (E) none of these

_____ 2. For, $g(x) = \frac{2x^2 - 2x - 12}{3x^2 - 24x + 45}$ find $\lim_{x \rightarrow 0} g(x)$
 (A) $\frac{4}{15}$ (B) $\frac{-4}{15}$ (C) $\frac{2}{3}$ (D) 0 (E) DNE

_____ 3. For, $g(x) = \frac{2x^2 - 2x - 12}{3x^2 - 24x + 45}$ find $\lim_{x \rightarrow \infty} g(x)$
 (A) ∞ (B) $-\infty$ (C) $\frac{2}{3}$ (D) 0 (E) DNE

_____ 4. For, $g(x) = \frac{2x^2 - 2x - 12}{3x^2 - 24x + 45}$ find $\lim_{x \rightarrow 5} g(x)$
 (A) 0 (B) 0 (C) $\frac{-5}{3}$ (D) $\frac{2}{3}$ (E) DNE

_____ 5. For, $g(x) = \frac{2x^2 - 2x - 12}{3x^2 - 24x + 45}$, find $\lim_{x \rightarrow 3} g(x)$
 (A) 0 (B) 0 (C) $\frac{-5}{3}$ (D) $\frac{2}{3}$ (E) DNE

_____ 6. Which of the following is **an** asymptote of the following function? $g(x) = \frac{x-5}{(x-9)(x+8)}$?
 (A) $x = -9$ (B) $y = 9$ (C) $x = -8$ (D) $y = 8$

_____ 7. the domain of $f(x) = \frac{\sqrt{9-x^2}}{x-1}$
 (A) $[-3,1) \cup (1,3]$ (B) $[-9,1) \cup (1,9]$ (C) $(-\infty, -3) \cup (3, \infty)$ (D) $[-3,3]$

_____ 8. Find $\lim_{x \rightarrow 4^+} \frac{x^3 - 64}{x - 4}$
 (A) $-\infty$ (B) 4 (C) ∞ (D) ∞ (E) 48

_____ 9. The function $f(t) = \frac{t^3 + 2t^2 - 13t + 10}{t^3 + 4t^2 - 4t - 16}$ has a hole at the coordinate $(2, y)$. $y =$
 (A) $\frac{5}{8}$ (B) $\frac{7}{24}$ (C) 1 (D) $-\frac{4}{17}$ (E) none of these

Part II: Free Response. Show all work. Give simplified exact answers. Work below the line.

10. For $f(x) = \frac{(x^2 - x - 12)(x^2 - 5x - 6)}{(x + 4)(x^2 + 2x - 3)}$

- a) What is the domain of $f(x)$?
 - b) Give the equation of any vertical asymptotes.
 - c) Give the coordinate (x, y) of any removable point discontinuities.
 - d) Give the coordinate (x, y) of any y -intercept.
 - e) Give the coordinate (x, y) of any x -intercepts.
 - f) Find the equation of any end-behavior asymptote (Horizontal or Slant Asymptotes.)
 - g) $\lim_{x \rightarrow \infty} f(x) =$
 - h) $\lim_{x \rightarrow -\infty} f(x) =$
 - i) $\lim_{x \rightarrow -3} f(x) =$
 - j) Sketch a graph of $f(x)$ showing all the information above.
 - k) What is the range of $f(x)$?
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11. Solve the following. Show simplified, exact answers. Show all steps. Box your final answers and show considered extraneous solutions with an "X" through them.

Radical Equations:

a. $\sqrt{x-1} + 7 = x$

b. $\sqrt{x-3} - \sqrt{x} = 3$

c. $\sqrt{x-3} + \sqrt{x} = 3$

d. $\sqrt{9x^2 + 4} - 2 = 3x$

e. $\sqrt{2x^2 - 7} + x = 3$

f. $\sqrt{2x+9} - \sqrt{x+1} = \sqrt{x+4}$

g. $\sqrt{x}\sqrt{x-7} = 12$

h. $\sqrt[3]{x^3 - 3x^2} + 1 = x$

Rational Equations

i. $\frac{x}{x-2} + \frac{1}{x-4} = \frac{2}{x^2 - 6x + 8}$

j. $\frac{5}{2y+6} + \frac{1}{y-2} = \frac{1}{y+3}$

k. $\frac{1}{x-3} - \frac{10}{x^2 - 9} = -\frac{1}{x+3}$

$$l. \frac{2x-1}{x+1} = \frac{2x}{x-1} + \frac{5}{x}$$

$$m. \frac{34}{x^2-3x+7} + 5 = 2x-3$$

Inequalities (write your answers in interval notation):

$$n. \frac{4x+1}{2} \geq \frac{x}{3} - 2$$

$$o. x^2 + 2x < 15$$

$$p. 6x^2 + 5 > -17x$$

$$q. \frac{5x+1}{x} \leq 1$$

$$r. \frac{3x+1}{x-2} > 2$$

$$s. \frac{(-2x-10)(3-x)}{(x^2+5)(x-2)^2} \leq 0$$