

Rational Functions Worksheet

Section 2.6

For Problems #1-5, find the following:

- a) Domain in set notation. Point(s) of discontinuity
 - b) State mathematically whether the function is even, odd or neither
 - c) Vertical Asymptote(s)
 - d) Horizontal asymptote
 - e) Slant or oblique asymptote
 - f) X-intercept(s)
 - g) Y-intercept
 - h) Removable Discontinuity (Holes)
 - i) Graph $f(x)$
- if the answer does not exist, write "none"

$$1) f(x) = \frac{5}{x-3} + 2$$

$$2) f(x) = \frac{3x^2}{16-x^2}$$

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

$$4) f(x) = \frac{x(x+3)(x-1)}{(x-1)(x+2)^2(x-2)}$$

$$5) x^2 - xy + 2x + 2y - 15 = 0$$

Part 2 - Choose the answer that best fits

6) What is the domain of $f(x) = \frac{\sqrt{x^2 - 4}}{x - 3}$?

- a) all real #'s b) $|x| \leq 2$ c) $|x| \geq 2$ d) $|x| \geq 2, x \neq 3$ e) $x \geq 2, x \neq 3$

7) If $xy - x = 2y - 5$, then which of the following must be true?

- I. the relation is a function
II. the domain of x is all real #'s except 2
III. the range is all real #'s

- a) I only b) II only c) I and II only d) I and III only e) I, II, and III

8) If $y = \left| \cos x - \frac{1}{4} \right|$ then the largest possible value for y is

- a) $\frac{3}{4}$ b) $\frac{5}{4}$ c) $\frac{1}{4}$ d) 2π e) π

9) If $f(x) = \cos(\arcsin x)$, what is the range of $f(x)$?

- a) $[0, 2\pi]$ b) $\left[\frac{-\pi}{2}, \frac{\pi}{2} \right]$ c) $[-1, 1]$ d) $[0, 1]$ e) $[-1, 0]$

10) What is the period for $y = 2\cos\left(\frac{x}{3} - \frac{1}{2}\right)$?

- a) 2 b) $\frac{\pi}{3}$ c) 3 d) 6π e) π