Rational Functions Worksheet

Sections 2.6 and 2.7

For Problems #1-5, find the following:

a) Domain in set notation
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) $f(x) = \dfrac{5}{x-3} + 2$

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

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

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

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

Part 2 - Choose the answer that best fits

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

a) all real #'s b) $|x| \le 2$ c) $|x| \ge 2$ d) $|x| \ge 2, x \ne 3$ e) $x \ge 2, x \ne 3$

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

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

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

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

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

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