

Rational Functions

Name _____

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Date _____

Identify the points of discontinuity, holes, vertical asymptotes, x-intercepts, and domain of each.

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

2) $f(x) = \frac{x^2 + x - 6}{4x - 12}$

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

4) $f(x) = \frac{x - 2}{-2x^2 + 4x + 6}$

5) $f(x) = \frac{x^3 - 4x}{-3x^2 + 27}$

6) $f(x) = \frac{3x^2 - 9x}{x^2 - x - 2}$

$$7) f(x) = \frac{x^2 + 3x - 4}{x^2 - 4}$$

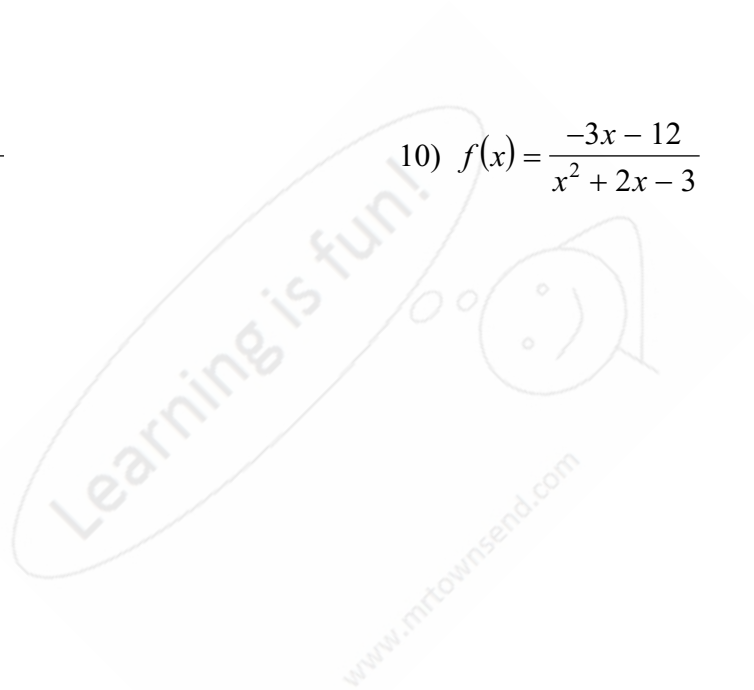
$$8) f(x) = \frac{x^3 - 2x^2 - 8x}{2x^2 - 4x}$$

$$9) f(x) = -\frac{2}{x^2 - 2x - 3}$$

$$10) f(x) = \frac{-3x - 12}{x^2 + 2x - 3}$$

$$11) f(x) = \frac{x^2 - 6x + 8}{x^2 - 3x + 2}$$

$$12) f(x) = \frac{x^2 + 4x}{x^2 + 5x + 4}$$



Answers to Rational Functions

- | | |
|---|---|
| 1) Discontinuities: 0
Vertical Asym.: $x = 0$
Holes: None
X-intercepts: 4, -4
Domain: All reals except 0 | 2) Discontinuities: 3
Vertical Asym.: $x = 3$
Holes: None
X-intercepts: 2, -3
Domain: All reals except 3 |
| 3) Discontinuities: 2, -1, 0
Vertical Asym.: $x = 2, x = -1$
Holes: $x = 0$
X-intercepts: 1, -3
Domain: All reals except 2, -1, 0 | 4) Discontinuities: 3, -1
Vertical Asym.: $x = 3, x = -1$
Holes: None
X-intercepts: 2
Domain: All reals except 3, -1 |
| 5) Discontinuities: 3, -3
Vertical Asym.: $x = 3, x = -3$
Holes: None
X-intercepts: 0, 2, -2
Domain: All reals except 3, -3 | 6) Discontinuities: 2, -1
Vertical Asym.: $x = 2, x = -1$
Holes: None
X-intercepts: 0, 3
Domain: All reals except 2, -1 |
| 7) Discontinuities: 2, -2
Vertical Asym.: $x = 2, x = -2$
Holes: None
X-intercepts: 1, -4
Domain: All reals except 2, -2 | 8) Discontinuities: 2, 0
Vertical Asym.: $x = 2$
Holes: $x = 0$
X-intercepts: 4, -2
Domain: All reals except 2, 0 |
| 9) Discontinuities: 3, -1
Vertical Asym.: $x = 3, x = -1$
Holes: None
X-intercepts: None
Domain: All reals except 3, -1 | 10) Discontinuities: 1, -3
Vertical Asym.: $x = 1, x = -3$
Holes: None
X-intercepts: -4
Domain: All reals except 1, -3 |
| 11) Discontinuities: 1, 2
Vertical Asym.: $x = 1$
Holes: $x = 2$
X-intercepts: 4
Domain: All reals except 1, 2 | 12) Discontinuities: -1, -4
Vertical Asym.: $x = -1$
Holes: $x = -4$
X-intercepts: 0
Domain: All reals except -1, -4 |