Hon Alg 2 Bellwork Friday, June 9, 2017

1. Use this rational function: $y = \dfrac{-3x^2 - 12x + 36}{x^3 - 9x}$ Find the x and y-intercepts, if any

x-intercepts: y-intercepts:

2. Use this rational function: $y = \dfrac{2x^2 - 2x - 12}{4x^4 + 12x^3 - 16x^2 - 48x}$

Find points of discontinuity, if any, and classify them as Holes or Vertical Asymptotes.

Holes: Vertical Asymptotes:

Simplify each. Use absolute value symbols when necessary.

3. $\sqrt[4]{162a^9b^{20}c^{47}}$

4. $\sqrt[5]{96x^{28}y^{32}z^{14}}$

5. Solve this rational equation:

$\dfrac{x}{x+4} + \dfrac{7}{x-1} = \dfrac{x+34}{x^2+3x-4}$

6. Solve this radical equation:

$\sqrt{24 - 4x} + 3 = x$

7. Rationalize each denominator. Simplify if possible. and simplify

a). $\dfrac{12a}{\sqrt[4]{9a^3b^5c}}$

b) $\dfrac{15}{9 - \sqrt{6}}$

8. Write the equation of the Horizontal Asymtptote, if any.

a) $\dfrac{4x^2 + 5x - 9}{2x^3 + 3}$

b) $\dfrac{x^3 - 6x^2 + 7x - 1}{3x^2 - 9x + 2}$

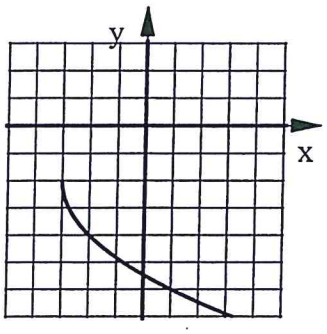
c) $\dfrac{10x + 7}{5x^2 + x - 11}$

9. Write the equation of the inverse relation.

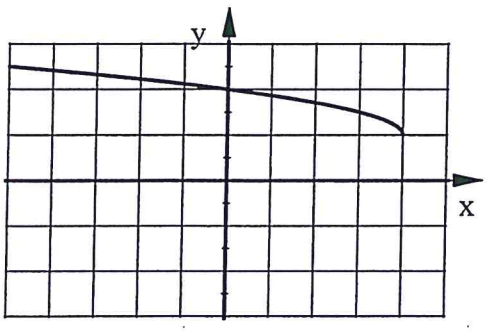
$y = \dfrac{5 \cdot \sqrt[3]{2x - 3} + 7}{8}$

10. Write the equation of each.

a)



b)



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ANSWERS

1. Use this rational function: $y = \frac{-3x^2 - 12x + 36}{x^3 - 9x}$ Find the x and y-intercepts, if any

x-intercepts: $x = -6, 2$

y-intercepts: NONE

$\frac{-3(x^2 + 4x - 12)}{x(x^2 - 9)} = \frac{-3(x+6)(x-2}{x(x+3)(x-3}$

2. Use this rational function: $y = \frac{2x^2 - 2x - 12}{4x^4 + 12x^3 - 16x^2 - 48x}$

Find points of discontinuity, if any, and classify them as Holes or Vertical Asymptotes.

$4x(x^3 + 3x^2 - 4x - 12$

	x	$+3$
x^2	x^3	$+3x^2$
-4	$-4x$	-12

Holes: $x = -2$

Vertical Asymptotes: $x = 0, -3, 2$

$\frac{2(x^2 - x - 6)}{4x(x+3)(x^2-4)}$

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

pts of discontinuity $x = 0, -3, \pm 2$

Simplify each. Use absolute value symbols when necessary.

3. $\sqrt[4]{162a^9b^{20}c^{47}} = \sqrt[4]{81 \cdot 2 a^9 b^{20} c^{47}}$

$2^4 = 16$
$3^4 = 81$
$4^4 = 256$

$3a^2|b^5||c^{11}|\sqrt[4]{2ac^3}$

4. $\sqrt[5]{96x^{28}y^{32}z^{14}} = \sqrt[5]{32 \cdot 3\, x^{28} y^{32} z^{14}}$

$= 2x^5y^6z^2\sqrt[5]{3x^3y^2z^4}$

$2^5 = 32$
$3^5 = 24$

5. Solve this rational equation: $\frac{x}{x+4} + \frac{7}{x-1} = \frac{x+34}{x^2+3x-4}$

$x = -6$

$\frac{x}{x+4} \cdot \frac{(x-1)}{(x-1)} + \frac{7}{x-1} \cdot \frac{(x+4)}{(x+4)} = \frac{x+34}{(x+4)(x-1)}$

$x(x-1) + 7(x+4) = x+34$

$x^2 - x + 7x + 28 = x + 34$

$x^2 + 5x - 6 = 0$

$(x+6)(x-1) = 0$

$x = -6, 1$

6. Solve this radical equation: $\sqrt{24 - 4x} + 3 = x$

$x = 5$

$(\sqrt{24-4x})^2 = (x-3)^2$

$24 - 4x = x^2 - 6x + 9$

$0 = x^2 - 2x - 15$

$0 = (x-5)(x+3)$

$x = -3, 5$

7. Rationalize each denominator. Simplify if possible. and simplify

a). $\frac{12a}{\sqrt[4]{9a^3b^5c}} \cdot \frac{\sqrt[4]{3^2ab^3c^3}}{\sqrt[4]{3^2ab^3c^3}}$

3^2

$= \frac{12a\sqrt[4]{9ab^3c^3}}{\sqrt[4]{3^4a^4b^8c^4}}$

$= \frac{12a\sqrt[4]{9ab^3c^3}}{3ab^2c}$

$= \boxed{\frac{4\sqrt[4]{9ab^3c^3}}{b^2c}}$

b) $\frac{15}{9-\sqrt{6}} \cdot \frac{9+\sqrt{6}}{9+\sqrt{6}} = \frac{15(9+\sqrt{6})}{75}$

$81-6$

$= \boxed{\frac{9+\sqrt{6}}{5}}$

8. Write the equation of the Horizontal Asymtptote, if any.

a) $\frac{4x^2+5x-9}{2x^3+3}$ $\boxed{y=0}$

b) $\frac{x^3-6x^2+7x-1}{3x^2-9x+2}$ $\boxed{\text{NO HA}}$

c) $\frac{10x+7}{5x^2+x-11}$ $\boxed{y=0}$

9. Write the equation of the inverse relation.

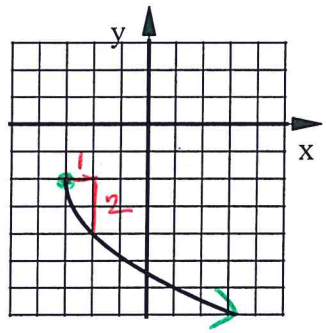
$y = \frac{5\cdot\sqrt[3]{2x-3}+7}{8}$

$x = \frac{5\cdot\sqrt[3]{2y-3}+7}{8}$

$\boxed{f^{-1} = \frac{\left(\frac{8x-7}{5}\right)^3+3}{2}}$

10. Write the equation of each.

a)



this graph

$\frac{1}{2}$

parent function

$\sqrt{\ }$

1

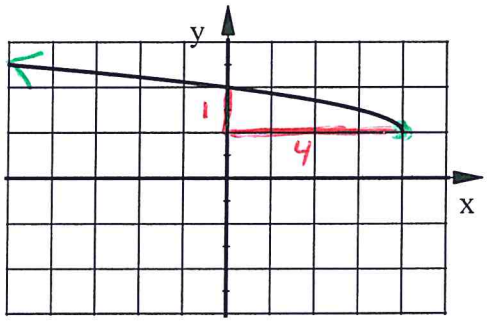
3 left 2 down

upside down

2x taller

$\boxed{y = -2\sqrt{x+3} - 2}$

b)



1/2 as tall

4 RT 1 up

Backwards

THIS graph

$\frac{1}{4}$

parent function

$\sqrt{\ }$ 2

4

$\boxed{y = \frac{1}{2}\sqrt{-(x-4)} + 1}$