Math 3 Honors U5D6b Name_____

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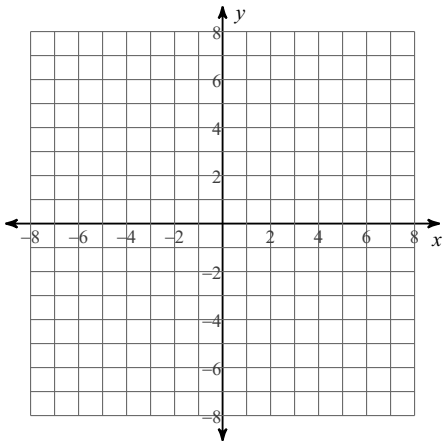
# Solving Rational Equations by Graphing Day 2

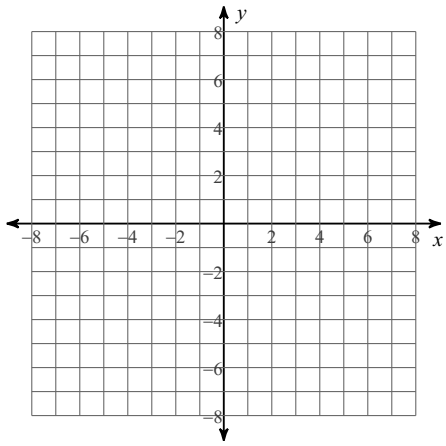
Date_____ Period____

**Identify the holes, asymptotes, intercepts, and domain of each. Then sketch the graph.**

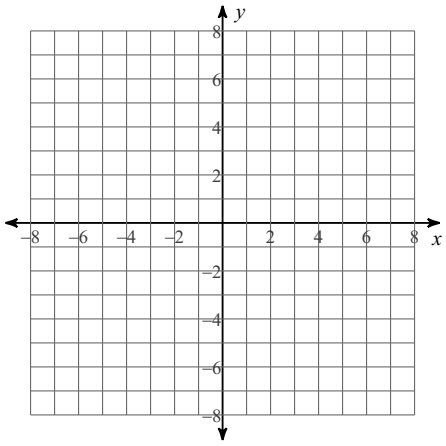
1) $f(x) = \dfrac{x^3 + x^2 - 12x}{4x^2 + 12x}$



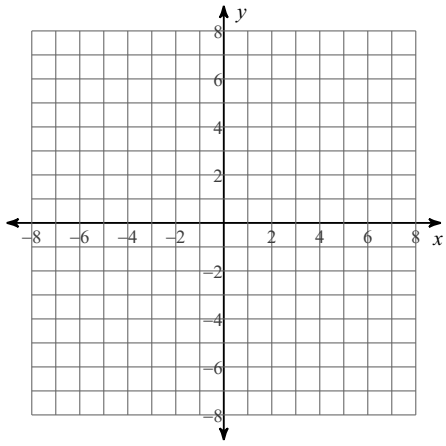

2) $f(x) = \dfrac{x}{4x + 16}$




3) $f(x) = \dfrac{x^2 + x - 2}{2x^2 - 10x + 8}$




4) $f(x) = \dfrac{x^3 - 4x}{-4x^2 - 12x - 8}$

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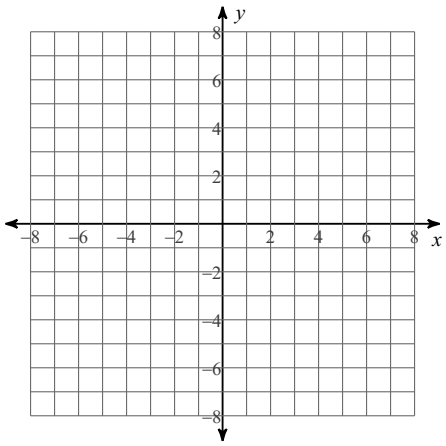
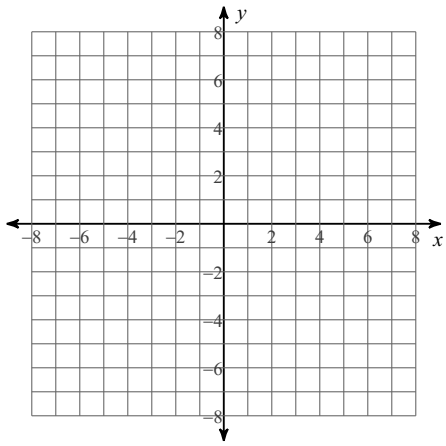
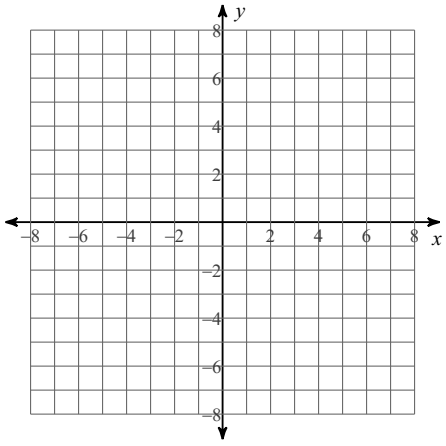
5) $f(x) = \dfrac{x^3 - 16x}{-4x^2 + 4x}$



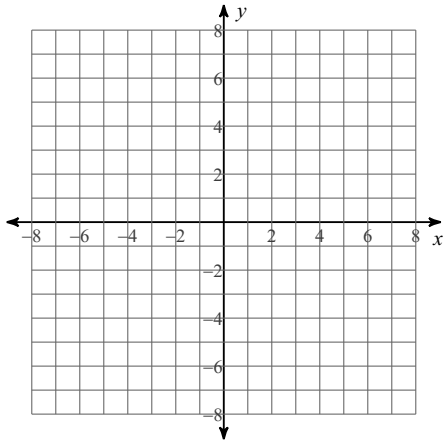

6) $f(x) = \dfrac{x + 2}{4x + 12}$



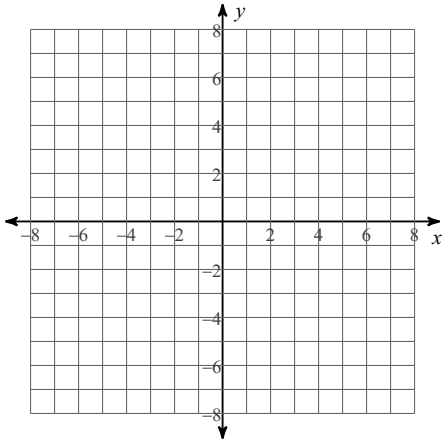

7) $f(x) = \dfrac{-3x^2 - 3x + 18}{x^2 - 4}$




8) $f(x) = \dfrac{x^3 + x^2 - 2x}{-3x^3 - 9x^2 + 12x}$




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

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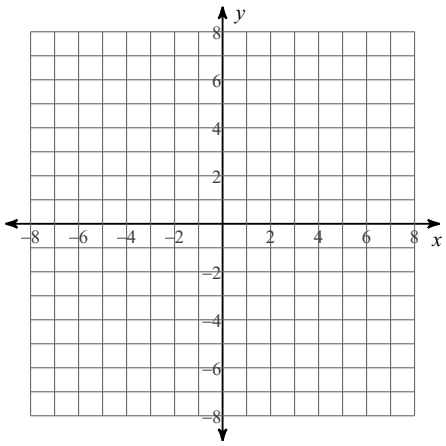
10) $f(x) = \dfrac{x^2 + 2x - 8}{x^2 + 2x - 3}$




**Simplify each expression.**

11) $\dfrac{6}{5m} - \dfrac{m+4}{m-3}$

12) $\dfrac{5}{3v} - \dfrac{v-2}{3v-3}$

13) $\dfrac{6x-4}{x+4} - \dfrac{5x}{4}$

14) $\dfrac{6x}{2x+3} - \dfrac{4}{x-6}$

15) $\dfrac{p+8}{p-10} \div \dfrac{7p+63}{p+9}$

16) $\dfrac{x^2 + 2x - 35}{x-8} \div \dfrac{x-5}{7x}$

17) $\dfrac{10}{10n-20} \div \dfrac{1}{n-1}$

18) $\dfrac{20r^3 - 60r^2}{3} \div \dfrac{12r-36}{6}$

19) $\dfrac{b+2}{b^2 - 13b + 30} \cdot \dfrac{b^2 - 13b + 30}{b-2}$

20) $\dfrac{k-8}{k+9} \cdot \dfrac{k^2 - k - 90}{k-8}$

21) $\dfrac{12x+6}{4x} \cdot \dfrac{1}{12x+6}$

22) $\dfrac{1}{n+7} \cdot \dfrac{10n+70}{n-9}$

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# Solving Rational Equations by Graphing Day 2

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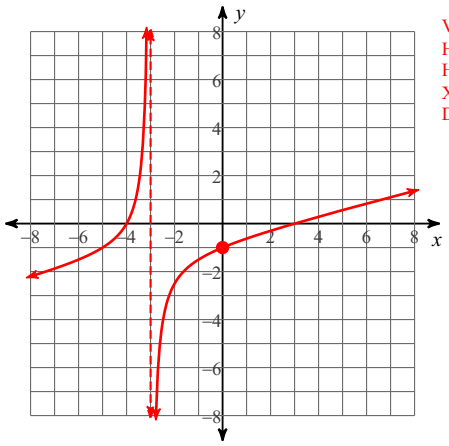
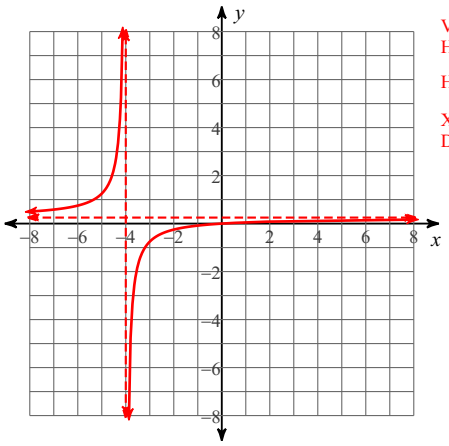
**Identify the holes, asymptotes, intercepts, and domain of each. Then sketch the graph.**

1) $f(x) = \dfrac{x^3 + x^2 - 12x}{4x^2 + 12x}$



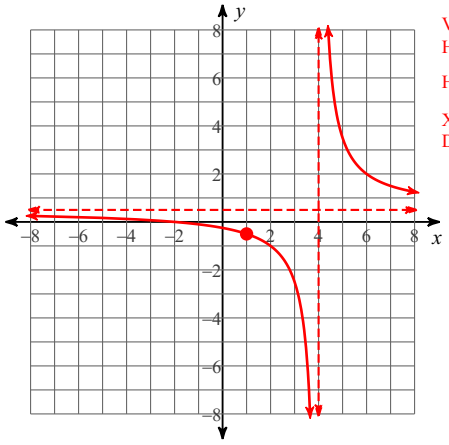
Vertical Asym.: $x = -3$
Holes: $x = 0$
Horz. Asym.: None
X-intercepts: 3, −4
Domain:
All reals except −3, 0

2) $f(x) = \dfrac{x}{4x + 16}$



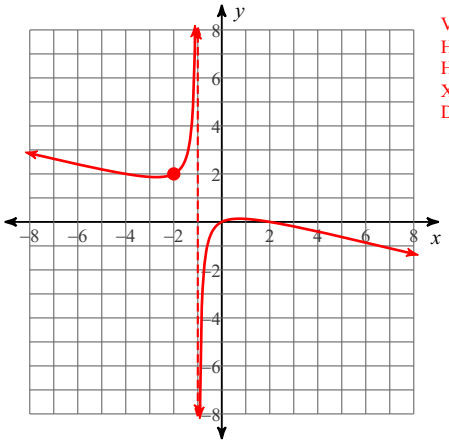
Vertical Asym.: $x = -4$
Holes: None
Horz. Asym.: $y = \frac{1}{4}$
X-intercepts: 0
Domain:
All reals except −4

3) $f(x) = \dfrac{x^2 + x - 2}{2x^2 - 10x + 8}$



Vertical Asym.: $x = 4$
Holes: $x = 1$
Horz. Asym.: $y = \frac{1}{2}$
X-intercepts: −2
Domain:
All reals except 4, 1

4) $f(x) = \dfrac{x^3 - 4x}{-4x^2 - 12x - 8}$



Vertical Asym.: $x = -1$
Holes: $x = -2$
Horz. Asym.: None
X-intercepts: 0, 2
Domain:
All reals except −1, −2

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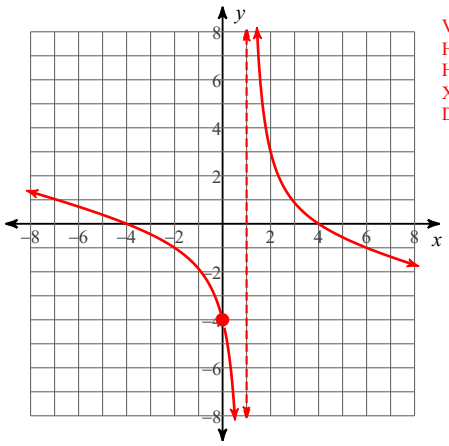
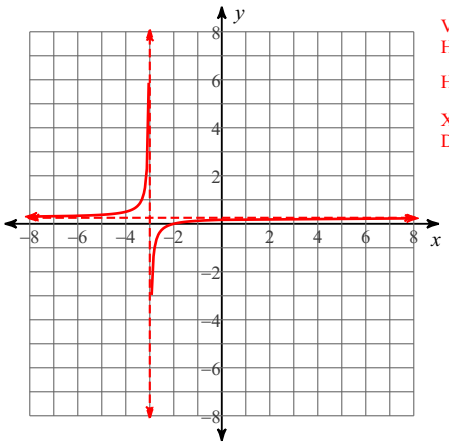
5) $f(x) = \dfrac{x^3 - 16x}{-4x^2 + 4x}$



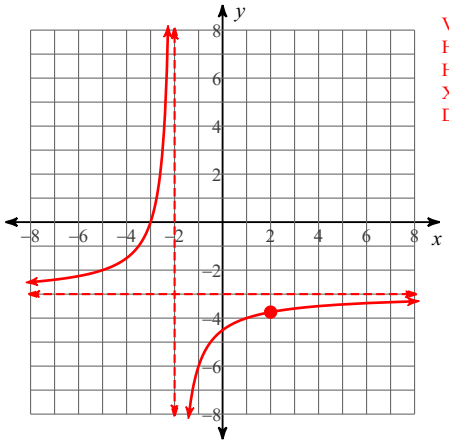
Vertical Asym.: $x = 1$
Holes: $x = 0$
Horz. Asym.: None
X-intercepts: 4, −4
Domain:
All reals except 1, 0

6) $f(x) = \dfrac{x + 2}{4x + 12}$



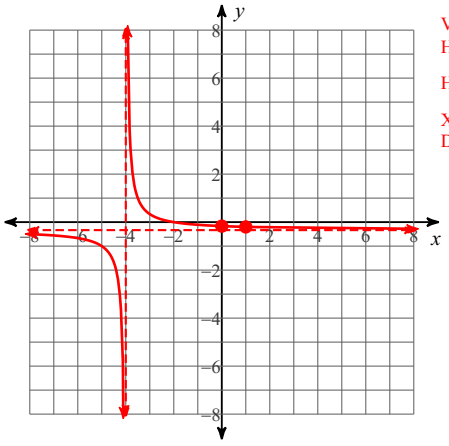
Vertical Asym.: $x = -3$
Holes: None
Horz. Asym.: $y = \dfrac{1}{4}$
X-intercepts: −2
Domain:
All reals except −3

7) $f(x) = \dfrac{-3x^2 - 3x + 18}{x^2 - 4}$



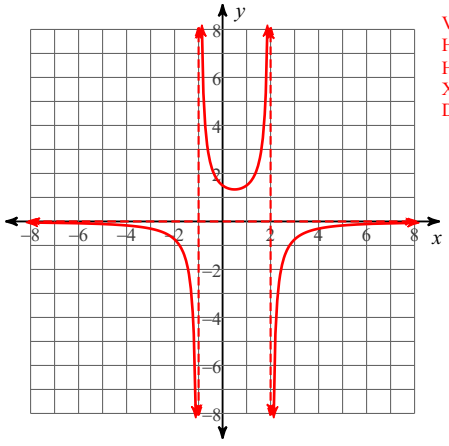
Vertical Asym.: $x = -2$
Holes: $x = 2$
Horz. Asym.: $y = -3$
X-intercepts: −3
Domain:
All reals except −2, 2

8) $f(x) = \dfrac{x^3 + x^2 - 2x}{-3x^3 - 9x^2 + 12x}$



Vertical Asym.: $x = -4$
Holes: $x = 0$, $x = 1$
Horz. Asym.: $y = -\dfrac{1}{3}$
X-intercepts: −2
Domain:
All reals except −4, 0, 1

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



Vertical Asym.: $x = 2$, $x = -1$
Holes: None
Horz. Asym.: $y = 0$
X-intercepts: None
Domain:
All reals except 2, −1

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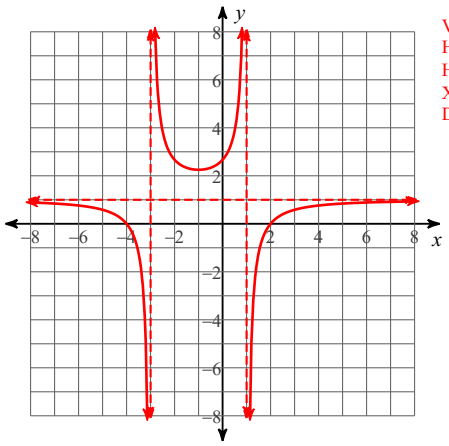
10) $f(x) = \dfrac{x^2 + 2x - 8}{x^2 + 2x - 3}$




Vertical Asym.: $x = 1$, $x = -3$
Holes: None
Horz. Asym.: $y = 1$
X-intercepts: 2, −4
Domain:
All reals except 1, −3

**Simplify each expression.**

11) $\dfrac{6}{5m} - \dfrac{m+4}{m-3}$

$\dfrac{-14m - 18 - 5m^2}{5m(m-3)}$

12) $\dfrac{5}{3v} - \dfrac{v-2}{3v-3}$

$\dfrac{7v - 5 - v^2}{3v(v-1)}$

13) $\dfrac{6x-4}{x+4} - \dfrac{5x}{4}$

$\dfrac{4x - 16 - 5x^2}{4(x+4)}$

14) $\dfrac{6x}{2x+3} - \dfrac{4}{x-6}$

$\dfrac{6x^2 - 44x - 12}{(x-6)(2x+3)}$

15) $\dfrac{p+8}{p-10} \div \dfrac{7p+63}{p+9}$ $\dfrac{p+8}{7(p-10)}$

16) $\dfrac{x^2 + 2x - 35}{x-8} \div \dfrac{x-5}{7x}$ $\dfrac{7x(x+7)}{x-8}$

17) $\dfrac{10}{10n-20} \div \dfrac{1}{n-1}$ $\dfrac{n-1}{n-2}$

18) $\dfrac{20r^3 - 60r^2}{3} \div \dfrac{12r-36}{6}$ $\dfrac{10r^2}{3}$

19) $\dfrac{b+2}{b^2 - 13b + 30} \cdot \dfrac{b^2 - 13b + 30}{b-2}$ $\dfrac{b+2}{b-2}$

20) $\dfrac{k-8}{k+9} \cdot \dfrac{k^2 - k - 90}{k-8}$

$k - 10$

21) $\dfrac{12x+6}{4x} \cdot \dfrac{1}{12x+6}$ $\dfrac{1}{4x}$

22) $\dfrac{1}{n+7} \cdot \dfrac{10n+70}{n-9}$ $\dfrac{10}{n-9}$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