

Midterm Review – Chapter 8
 Class Review
 Honors Algebra 2

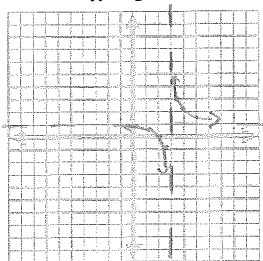
Name KEY 2014-15

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Together:

For #1-2, graph and determine: the equations of the HA and VA, domain, range, and end behavior.

1. $y = \frac{1}{x-3} + 1$



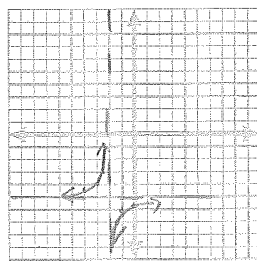
HA: $y=1$
 VA: $x=3$

D: All IR except $x \neq 3$
 R: All IR except $y \neq 1$
 AS $x \rightarrow -\infty, y \rightarrow 1^-$
 AS $x \rightarrow \infty, y \rightarrow 1^+$

Practice:

For #1-2, graph and determine: the equations of the HA and VA, domain, range, and end behavior.

2. $y = \frac{-1}{x+2} - 5$



HA: $y=-5$
 VA: $x=-2$

D: All IR except $x \neq -2$
 R: All IR except $y \neq -5$
 AS $x \rightarrow -\infty, y \rightarrow -5^+$
 AS $x \rightarrow \infty, y \rightarrow -5^-$

For #3-12, simplify completely. Do not forget to state your restrictions!

3. $\frac{x^2 + 4x}{x^2 - 2x - 24} = \frac{x(x+4)}{(x-6)(x+4)}$

$= \frac{x}{x-6}, x \neq 6, -4$

4. $\frac{x^2 + 4x - 5}{x^2 - 25} = \frac{(x+5)(x-1)}{(x+5)(x-5)}$

$= \frac{(x-1)}{(x-5)}, x \neq \pm 5$

5. $\frac{3x^2y - 9x + 6x^3y^2}{3x}$

$= \frac{3x(xy - 3 + 2x^2y^2)}{3x}$

$= xy - 3 + 2x^2y^2, x \neq 0$

6. $\frac{2x^2y}{4xy^3 - 10y} = \frac{2x^2y}{2y(2xy^2 - 5)}$

$= \frac{x^2}{(2xy^2 - 5)}, y \neq 0$

$$7. \frac{3x^2-15x}{3x} \cdot \frac{2x^2-10x}{x^2-10x+25}$$

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

$$= 2x, x \neq 0, 5$$

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

$$\frac{-11x}{-x} \cdot \frac{12x^2}{3x}$$

$$8. \frac{2x^2-x-6}{x^3+2x^2} \cdot \frac{6x+12}{3x^2-12}$$

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

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

$$= \frac{2(2x+3)}{x^2(x+2)}, x \neq 0, -2, 2$$

$$9. \frac{3x^2yz}{4yz^2} \div \frac{x^4y}{5xy^2z}$$

$$= \frac{3x^2yz \cdot 5xy^2z}{4yz^2 \cdot x^4y}$$

$$= \frac{15x^3y^3z^2}{4x^4y^2z^2}$$

$$= \frac{15y^2z^2}{4x}, x \neq 0, y \neq 0, z \neq 0$$

$$11. \frac{x^2}{x^2-1} \div \frac{3x^2-x}{(3x-1)(x-1)}$$

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

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

$$= \frac{x}{(x+1)}, x \neq -1, 1, \frac{1}{3}$$

$$\frac{3x^2}{-3x} \cdot \frac{-x}{-4x}$$

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

$$10. \frac{22x^8y^2z^5}{14x^3z} \div \frac{32x^2yz^8}{35x^4y^3z}$$

$$= \frac{22x^8y^2z^5}{14x^3z} \cdot \frac{35x^4y^3z}{32x^2yz^8}$$

$$= \frac{770x^{12}y^5z^6}{448x^5yz^9}$$

$$= \frac{55x^7y^4z^3}{32z^3}$$

$$12. \frac{2x+1}{16x^2} \div \frac{2x^2+5x+2}{4x^3+4x}$$

$$= \frac{(2x+1)(x+2)}{16x^2} \cdot \frac{4x(x^2+1)}{(2x+1)(x+2)}$$

$$= \frac{4x(2x+1)(x^2+1)}{16x^2(2x+1)(x+2)}$$

$$= \frac{x^2+1}{4x(x+2)}, x \neq 0, -\frac{1}{2}, -2$$

$$\frac{4x^2}{4x} \cdot \frac{x}{5x}$$

$$\frac{(2x^2+4x)+(x+2)}{2x(x+2)+1(x+2)}$$

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For #
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and determine: the equations of the HA and VA, domain, range, and end

1. $y =$



HA: $x =$
D: ALL IR
R: ALL IR
AS $x \rightarrow -$
AS $x \rightarrow$

For #

3. $\frac{3x}{x^2 - 9}$

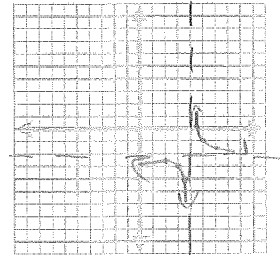


HA: $y = 0$
D: ALL IR except $x \neq -5$
R: ALL IR except $y \neq 0^+$
 $\rightarrow 0^-$

simplify completely. Do not forget to state your restrictions!

$$\frac{3(x-1)}{6} = \frac{(x-1)}{2}$$

2. $y = \frac{1}{x-4} - 2$



HA: $y = -2$ VA: $x = 4$
D: ALL IR except $x \neq 4$
R: ALL IR except $y \neq -2$
AS $x \rightarrow -\infty, y \rightarrow -2^-$
AS $x \rightarrow \infty, y \rightarrow -2^+$

$$4. \frac{x^3 - 27}{x^2 - 9} = \frac{(x-3)(x^2 + 3x + 9)}{(x+3)(x-3)} = \frac{(x^2 + 3x + 9)}{(x+3)}, x \neq 3$$

5. $\frac{6x^3 - 4x^3 - y^3}{y^3}$

$$\frac{2x^3 y^2}{y^3} = \frac{2x^3 y^2}{y^3} = \frac{2x^3}{y}$$

$x \neq 0$
 $y \neq 0$

$$6. \frac{3y^2}{12x^4 y^3 + 30y} = \frac{y^2}{3y(4x^4 y^2 + 10)} = \frac{y}{(4x^4 y^2 + 10)}$$

$$7. \frac{44x^7y^4}{5xy^2} \cdot \frac{12xy^5}{22x^5y^3}$$

$$= \frac{528x^8y^9}{110x^6y^5}$$

$$= \frac{24x^2y^4}{5}, \quad \begin{matrix} x \neq 0 \\ y \neq 0 \end{matrix}$$

$$9. \frac{6x^3y}{xy^2} \div \frac{8x^3}{3x^2y}$$

$$= \frac{6x^3y}{xy^2} \cdot \frac{3x^2y}{8x^3}$$

$$= \frac{18x^5y^2}{8x^4y^2}$$

$$= \frac{9x}{4}, \quad x \neq 0, y \neq 0$$

$$11. \frac{(x+5)(x+6)}{x^2+11x+30} \cdot \frac{(x+8)(x-4)}{x^2+4x-32}$$

$$\frac{(x+7)(x+8)}{3x(x+6)}$$

$$= \frac{(x+5)(x+8)(x-4)}{3x(x+7)(x+8)(x+6)}$$

$$= \frac{(x+5)(x-4)}{3x(x+7)}, \quad x \neq 0, -7, -8, -6$$

$$x(x+3)(x-3)$$

$$8. \frac{x(x^2-9)}{x^2+6x+9} \cdot \frac{x^2(x+3)}{x^3-9x}$$

$$\frac{(x+3)(x+3)}{(x+3)(x+3)}$$

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

$$= x^3, \quad x \neq -3, 3$$

$$(3x+1)(x+1)$$

$$10. \frac{3x^2+4x+1}{x^2-4} \div \frac{x+1}{x^2+8x+12}$$

$$= \frac{(3x+1)(x+1)(x+5)(x+6)}{(x+2)(x-2)(x+1)}$$

$$= \frac{(3x+1)(x+6)}{(x-2)}, \quad x \neq -2, 2, -1$$

$$\begin{array}{r} 3x^2 \\ 3x \quad \times \\ \hline 4x \end{array}$$

$$(3x^2+3x)+(x+1)$$

$$3x(x+1)+1(x+1)$$

$$(2x-1)(x+4) \cdot \frac{(x+1)(x+4)}{(x+1)(x+4)}$$

$$12. \frac{2x^2+7x-4}{x^2-6x+9} \div \frac{x^2+8x+16}{x^2+x-12}$$

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

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

$$= \frac{(2x-1)}{(x-3)}, \quad x \neq 3, -4$$

$$\begin{array}{r} -8x^2 \\ 8x \quad \times \\ \hline 7x \end{array}$$

$$(2x^2+8x)+(x-4)$$

$$2x(x+4)+1(x+4)$$

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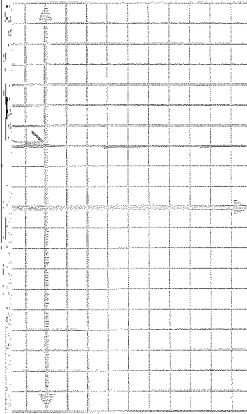
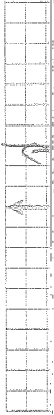
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1. C
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pt) $y = \frac{1}{x+4} + 3$ without using your calculator and fill in the missing information (1,



Equation of Asymptotes:

HA: $y=3$ VA: $x=-4$

Domain:

All \mathbb{R} except $x \neq -4$

Range:

All \mathbb{R} except $y \neq 3$

End Behavior:

As $x \rightarrow -\infty, y \rightarrow 3^-$

As $x \rightarrow \infty, y \rightarrow 3^+$

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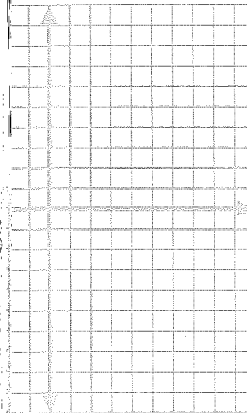
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Name _____

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1. C
each

pt) $y = \frac{1}{x+4} + 3$ without using your calculator and fill in the missing information (1,



Equation of Asymptotes:

Domain:

Range:

End Behavior:

For #2-3, simplify completely. (1 pt each)

$$2. \frac{3x^2 - 13x - 10}{x^2 + x - 30}$$

$$\begin{array}{r} -30x^2 \\ -15x \quad -2x \\ -13x \end{array}$$

$$= \frac{(3x+2)(x-5)}{(x+6)(x-5)}$$

$$(3x^2 - 15x) + (2x - 10)$$

$$3x(x-5) + 2(x-5)$$

$$= \frac{(3x+2)}{(x+6)}, x \neq -6, 5$$

$$3. \frac{18x^2y^3}{7xy^2} \div \frac{12x^4}{14xy} = \frac{18x^2y^3}{7xy^2} \cdot \frac{14xy}{12x^4}$$

$$= \frac{252x^3y^4}{84x^5y^2}$$

$$= \frac{3y^2}{x^2}, x \neq 0, y \neq 0$$

For #2-3, simplify completely. (1 pt each)

$$2. \frac{3x^2 - 13x - 10}{x^2 + x - 30}$$

$$3. \frac{18x^2y^3}{7xy^2} \div \frac{12x^4}{14xy}$$

Midterm Review – Chapter 8
Summative Ticket - VA
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For #1-2, simplify completely. (1 pt each)

1. $\frac{3x^2 - 13x - 10}{x^2 + x - 30}$

2. $\frac{18x^2y^3}{7xy^2} \div \frac{12x^4}{14xy}$

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Summative Ticket - VA
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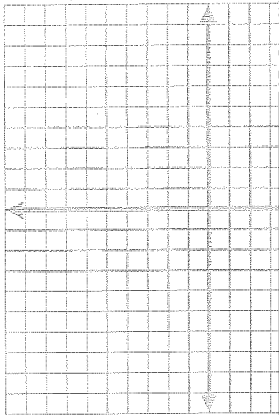
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For #1-2, simplify completely. (1 pt each)

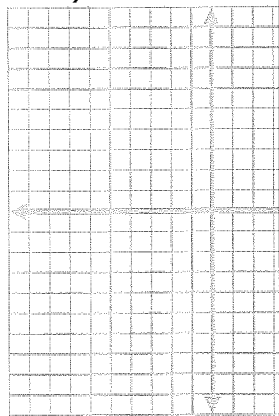
1. $\frac{3x^2 - 13x - 10}{x^2 + x - 30}$

2. $\frac{18x^2y^3}{7xy^2} \div \frac{12x^4}{14xy}$

3. Graph (1 pt) $y =$ (each).



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