

Name: _____ Date: _____

Equations & Inequalities: Review

L1 – Quadratic & Polynomial Inequalities

1. Determine the solution to each inequality by any of the methods used in class (graphing, test points or sign analysis).

a) $(x - 1)(x + 5) > 0$

b) $0 \geq (x - 1)^2 - 4$

c) $3(x + 1)(2x - 3) \leq 0$

d) $2x(x - 2) \leq 4$

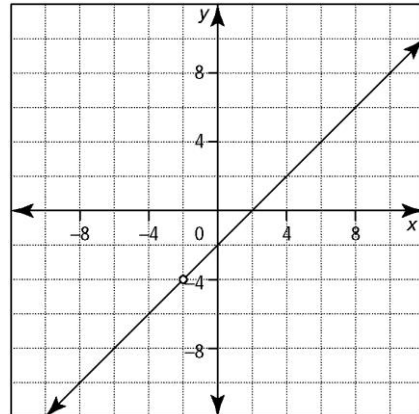
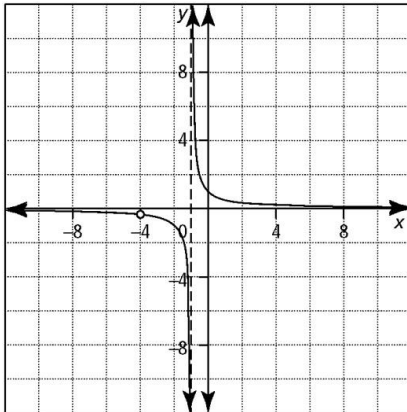
L2 – Rational Functions

2. Analyze the functions and state the location of any vertical asymptotes, horizontal asymptotes, points of discontinuity and intercepts.

a) $y = \frac{x^2 + 5x}{x^2 + 7x + 10}$

b) $y = \frac{x^2 - 2x}{x - 2}$

3. Write the equation for the rational functions shown



L3 – Rational Equations & Inequalities

4. Solve each of the following rational equations algebraically.

a) $\frac{x}{4} - \frac{3}{x} = 1$

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

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

d) $\frac{2}{x^2-4} + \frac{10}{6x+12} = \frac{1}{x-2}$

5. Solve each of the following rational equation applications.

a) Ms. Dobson can mark a class-set of tests in 1 hour less time than Mr. Chan. Working together, they can mark a class-set of tests in $\frac{2}{3}$ of an hour. How long does it take Mr. Chan to mark the class-set of tests alone?

b) A jet flies 852 miles with a tailwind in half the time it takes to fly 1560 miles against the same wind. Find the jet's average speed, if the wind speed is 18 miles/hour.

L4 – Radical Functions Equations & Inequalities

6. Solve each of the following radical equations algebraically

a) $\sqrt{r+15} = \sqrt{3r+1}$

b) $m - \sqrt{2m+3} = 6$

c) $\sqrt{x-3} + \sqrt{x} = 3$

d) $\sqrt{x+19} + \sqrt{x-2} = 7$

L5 – Absolute Functions, Equations & Inequalities

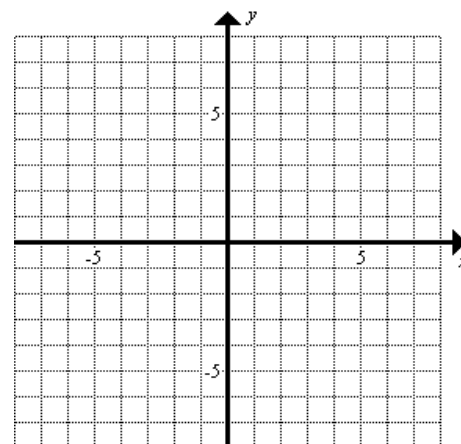
7. Find the piecewise definition of the followings.

a) $|2x-1|$

b) $|-6-3x|$

8. Consider the functions $f(x) = 2x - 3$ and $g(x) = |2x - 3|$

- a) Sketch both graphs on the same grid.
- b) Express $g(x)$ with piecewise notation.



9. Solve each equation algebraically

a) $|2x - 2| = 4$

b) $|x + 1| + 5 = 3x$

c) $|x^2 + 3x + 3| = 3x + 2$

d) $|3x - 4| = |2x - 1|$

Answers:

1. a) $x < -5$ or $x > 1$ b) $-1 \leq x \leq 3$ c) $-1 \leq x \leq \frac{3}{2}$ d) $1 - \sqrt{3} \leq x \leq 1 + \sqrt{3}$

2. a) VA: $x = -2$, HA: $y = 1$, POD: $(-5, 5/3)$, x-int = 0, y-int = 0 b) VA/HA: none, POD: $(2, 2)$, x-int = 0, y-int = 0

3. a) $y = \frac{x+4}{x^2+5x+4}$ b) $y = \frac{x^2-4}{x+2}$

4. a) $x = 6, -2$ b) $x = 4/3$ c) $x = -1, 5$ d) $x = 5$

5. a) 2 hours b) 408 miles/hour

6. a) $r = 7$ b) $m = 11$ c) $x = 4$ d) $x = 6$

7. a) $2x - 1, x \geq \frac{1}{2}$
 $-2x + 1, x < \frac{1}{2}$ b) $-6 - 3x, x \leq -2$
 $6 + 3x, x > -2$

8. $g(x) = \begin{cases} 2x - 3, x \geq \frac{3}{2} \\ -2x + 3, x < \frac{3}{2} \end{cases}$ use GDC to check graph

9. a) $x = -1, 3$ b) $x = 3$ c) No solution d) $x = 3, 1$