Name Key Date

Honors Algebra 2 Unit 5.5 Test Review

1) Raffaele ran 8 miles and then walked 6 miles. If he ran 5 miles per hour faster than he walked and the total time was 2 hours, then how fast did he walk?

	Distance	Rate	Time
Run	8	$x+5$	$\frac{8}{x+5}$
Walk	6	x	$\frac{6}{x}$

$\frac{8}{x+5} + \frac{6}{x} = 2$

$LCD = (x+5)(x)$

$8x + 6x + 30 = 2x^2 + 10x$

$0 = 2x^2 - 4x - 30$

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

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

$x = 5 \quad x = -3$

Raffaele walked 5 mph

2) Luisa participated in a triathlon in which she swam 3 miles, ran 5 miles, and then bicycled 10 miles. Luisa ran twice as fast as she swam, and she cycled three times as fast as she swam. If her total time for the triathlon was 1 hour and 46 minutes, then how fast did she swim?

	D	R	T
Swam	3	x	$\frac{3}{x}$
Ran	5	$2x$	$\frac{5}{2x}$
Biked	10	$3x$	$\frac{10}{3x}$

$\frac{3}{x} + \frac{5}{2x} + \frac{10}{3x} = 1.06$

LCD: $6x$

$18 + 15 + 20 = 6.36x$

$53 = 6.36x$

$\frac{53}{10.6} = \frac{10.6x}{10.6}$

$x = 5$

She swam 5 mph

3) Mr. McGregor has discovered that a large dog can destroy his entire garden in 2 hours and that a small boy can do the same job in 1 hour. How long would it take the large dog and the small boy working together to destroy Mr. McGregor's garden?

Dog = $\frac{1}{2}$

Boy = $\frac{1}{1}$

Together = $\frac{1}{x}$

$\frac{1}{2} + \frac{1}{1} = \frac{1}{x}$

LCD = $2x$

$x + 2x = 2$

$3x = 2$

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

It would take them 40 minutes working together

4) It takes a computer 8 days to print all of the personalized letters for a national sweepstakes. A new computer is purchased that can do the same job in 5 days. How long would it take to do the job with both computers working on it?

Old: $\frac{1}{8}$

New: $\frac{1}{5}$

Together: $\frac{1}{x}$

$\frac{1}{8} + \frac{1}{5} = \frac{1}{x}$

LCD = $40x$

$5x + 8x = 40$

$13x = 40$

$x = 3.08$

It would take 3.08 days working together

Solve the following inequality.

5) $\frac{t-3}{t+6} > 0$

zeros: $t = 3$

undefined: $t = -6$

$(-\infty, -6) \cup (3, \infty)$

6) $\frac{x}{x+2} > -1$

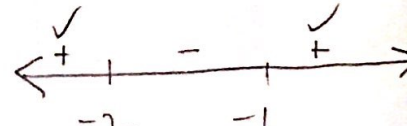
zeros: $x = -1$

undefined: $x = -2$

$\frac{x}{x+2} + \frac{1}{1} > 0$

$\frac{x + x + 2}{x+2} > 0$

$\frac{2x+2}{x+2} > 0$



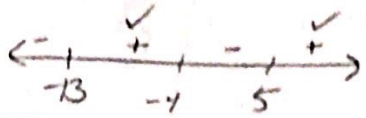
$(-\infty, -2) \cup (-1, \infty)$

7) $\frac{2}{x-5} > \frac{1}{x+4}$ zeros: -13 und: $x=-4, x=5$

$\frac{2}{x-5} - \frac{1}{x+4} > 0$

$\frac{2x+8-x+5}{(x-5)(x+4)} > 0$

$\frac{x+13}{(x+4)(x-5)} > 0$



$(-13,-4) \cup (5,\infty)$

8) $\frac{x}{x+20} > \frac{2}{x+8}$ $\frac{(x+10)(x-4)}{(x+20)(x+8)} > 0$

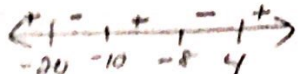
zeros: $-10, 4$

und: $-20, -8$

$\frac{x}{x+20} - \frac{2}{x+8} > 0$

$\frac{x^2+8x-2x-40}{(x+20)(x+8)} > 0$

$\frac{x^2+6x-40}{(x+20)(x+8)} > 0$



$(-\infty,-20) \cup (-10,-8) \cup (4,\infty)$

Graph the following. For each, identify the vertical asymptotes, horizontal asymptotes, domain, range, and holes.

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

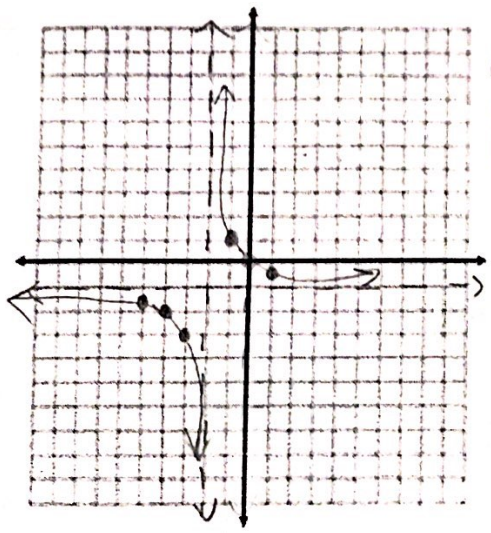
zeros: $x=0$

V.A.: $x=-2$

H.A: $y=-1$

Domain: $(-\infty,-2) \cup (-2,\infty)$

Range: $(-\infty,-1) \cup (-1,\infty)$



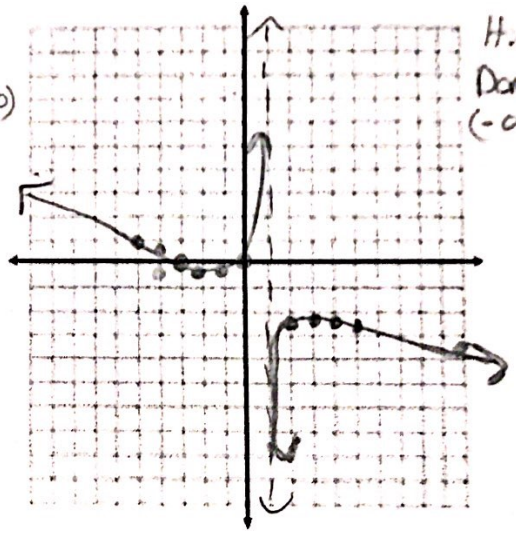
10) $f(x) = \frac{x^2+3x}{-4x+4}$

zeros: $x=0, x=-3$

V.A: $-4x+4=0$, $x=1$

H.A.: none

Domain: $(-\infty,1) \cup (1,\infty)$



11) $f(x) = \frac{x^3-2x^2-3x}{4x^2+8x} = \frac{x(x-3)(x+1)}{4x(x+2)}$

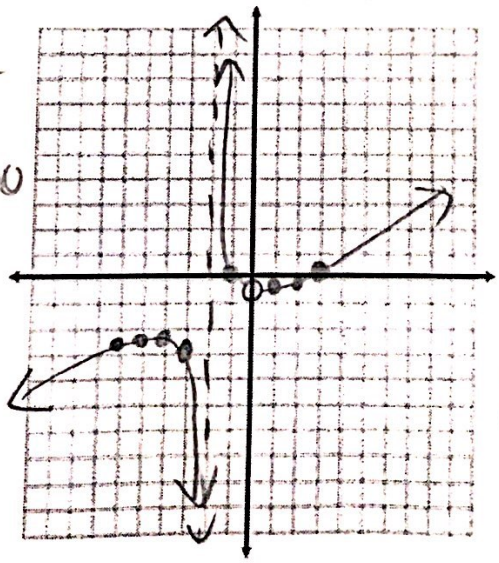
Holes: $x=0$

zeros: $x=3, x=-1$

V.A: $x=-2$

H.A: none

Domain: $(-\infty,-2) \cup (-2,0) \cup (0,\infty)$



Holes: $x=0$, $x=1$

zeros: $x=-1$

V.A: $x=-3$

H.A: $y=1$

Domain: $(-\infty,-3) \cup (-3,0) \cup (0,1) \cup (1,\infty)$

Range: $(-\infty,\infty)$

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