Math 3 Honors

Name Key ID: 1

**Simplify each and state the excluded values.**

1) $\frac{k+9}{k^2+2k-63}$ $= \frac{1}{k-7}$

Excluded $x \neq 7$ $x \neq -9$

2) $\frac{18n}{6n^2-30n}$ $= \frac{3}{n-5}$

$x \neq 0$ $x \neq 5$

**Simplify each expression.**

3) $\frac{5r}{3} + \frac{4r+5}{3r^2+9r}$ $= \frac{5r^3+15r^2+4r+5}{3r(r+3)}$

4) $\frac{4}{a-3} + \frac{6}{a+6}$ $\frac{10a+6}{(a-3)(a+6)}$

5) $\frac{6}{x-3} - \frac{4x}{x+3}$ $= \frac{20r-12}{5r-4}$

6) $\frac{3}{2b+4} - \frac{4}{6b}$ $\frac{5b-8}{6b(b+2)}$

7) $\frac{6r}{2r} + \frac{5r}{5r-4}$ $\frac{18x+18-4x^2}{(x+3)(x-3)}$

8) $\frac{10v-50}{3} \div \frac{10v+70}{v+7}$ $\frac{v-5}{3}$

9) $\frac{-p^2+13p-40}{p+8} \cdot \frac{p+8}{10p^2-80p}$ $\frac{-p+5}{10p}$

10) $\frac{x^2-10x+25}{x-5} \div \frac{x-5}{8}$ $8$

11) $\frac{a^2-36}{5} \cdot \frac{1}{a^2+13a+42}$ $\frac{a-6}{5(a+7)}$

12) $\frac{6b-12}{6} \div \frac{b-2}{3}$ $3$

13) $\frac{\frac{9}{25}+\frac{5}{9}}{\frac{x^2}{9}}$ $\frac{206}{25x^2}$

14) $\frac{\frac{4}{u+3}}{\frac{4}{u+3}+\frac{u+3}{8}}$ $\frac{32}{41+u^2+6u}$

**Solve each equation. Remember to check for extraneous solutions.**

15) $\frac{1}{6m} + \frac{m+2}{3m} = 1$ $m = 5/4$

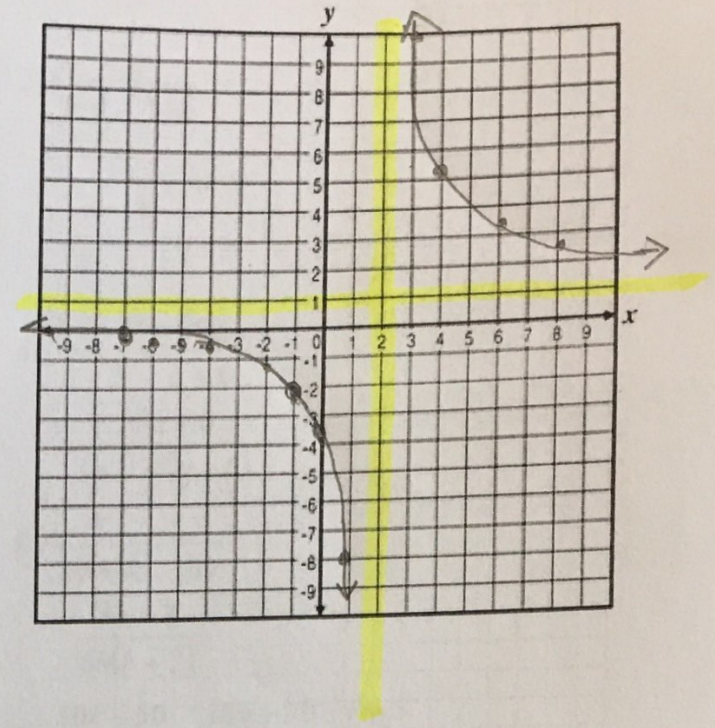
16) $\frac{2n-8}{n^2} + \frac{1}{n^2} = \frac{1}{2n^2}$ $n = 15/4$

17) $\frac{b+4}{b^2} = \frac{5}{b^2} + \frac{5}{b}$ $b = -1/4$

18) $\frac{3}{n^2+6n} = \frac{1}{n+6} + \frac{1}{n^2+6n}$ $n = 2$

Bell work:

$f(x) = \frac{x+7}{x-2}$



a.) y-intercepts: $(0, -7/2)$

b.) horizontal asymptote: $y = 1$

c.) oblique asymptote: none

d.) domain(interval notation): $(-\infty, 2) \cup (2, \infty)$

e.) hole: none

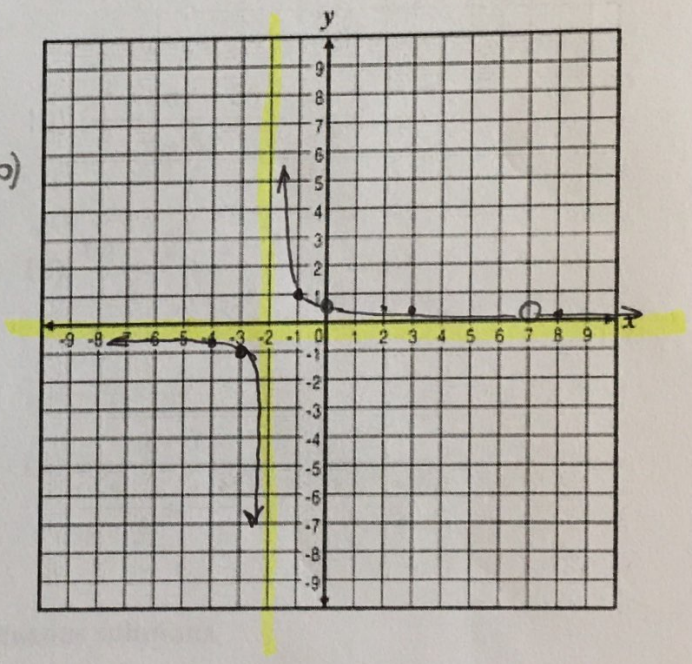
f.) x-intercept: $(-7, 0)$

g.) vertical asymptote: $x = 2$

h) End behavior: $x \to \infty \quad f(x) \to 1$

$x \to -\infty \quad f(x) \to 1$

2) $f(x) = \frac{x-7}{x^2-5x-14}$ $\frac{(x-7)}{(x-7)(x+2)}$ $\frac{1}{x+2}$



a.) y-intercepts: $(0, 1/2)$

b.) horizontal asymptote: $y = 0$

c.) oblique asymptote: none

d.) domain(interval notation): $(-\infty, -2) \cup (-2, 7) \cup (7, \infty)$

e.) hole: $(7, 1/9)$

f.) x-intercept: none

g.) vertical asymptote: $x = -2$

h) End behavior: $x \to -\infty \quad y \to 0$

$x \to \infty \quad y \to 0$

3) $f(x) = \frac{x^3+2x^2-8x}{x^2-1}$ do not graph

$$x^2 - 1 \;\overline{)\; x^3 + 2x^2 - 8x} \;\; x + 2$$

$$x^3 \qquad -x$$

$$2x^2$$

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

a.) y-intercepts: $(0, 0)$

b.) horizontal asymptote: none

c.) oblique asymptote: $y = x + 2$

d.) domain(interval notation): $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

e.) hole: no