

Review - End of PC Functions

Solve each equation. Remember to check for extraneous solutions.

$$1) \frac{p+3}{2p} - \frac{1}{4p^2+28p} = \frac{p+4}{2p}$$

$$\frac{(p+3)}{2p(4p+7)} - \frac{1}{4p(4p+7)} = \frac{(p+4)2(p+7)}{2p \cdot 2(4p+7)}$$

$$\frac{(a-b)}{(a-b)} \frac{a-4}{a-6} - \frac{1}{a^2-12a+36} = \frac{a-8}{a-6} \frac{(a-b)}{(a-b)}$$

$$\frac{(a-b)}{(a-b)} \frac{a-4}{a-6} - \frac{1}{(a-b)^2} = \frac{a-8}{a-6} \frac{(a-b)}{(a-b)}$$

$$2(p^2+10p+21) - 1 = \frac{2(p^2+14p+28)}{4p(4p+7)}$$

$$2p^2+20p+42-1 = 2p^2+22p+56$$

$$2p = -15 \quad \boxed{p = -\frac{15}{2}}$$

$$\frac{a^2-10a+24-1}{(a-b)^2} = \frac{a^2-14a+48}{(a-b)^2}$$

$$a^2-10a+23 = a^2-14a+48$$

$$\frac{4a}{4} = \frac{25}{4} \quad \boxed{a = \frac{25}{4}}$$

Simplify each expression.

$$\frac{(5r^2+11r+6) \frac{2r}{3}}{(5r+6)(r+1) 3r} - \frac{5}{60r^2+132r+72}$$

$$12(5r^2+11r+6) = 12(5r+6)(r+1)$$

$$\frac{40r^2+88r+48-5}{12(5r+6)(r+1)} = \frac{40r^2+88r+43}{12(5r+6)(r+1)}$$

$$4) \frac{4}{x-2} + \frac{5}{3 \frac{15x+15}{(15)(x+1)}} \frac{3(x+1)4}{3(x+1)x-2} + \frac{x}{3(x+1)} \frac{(x-2)}{(x-2)}$$

$$\frac{12x+12+x^2-2x}{3(x+1)(x-2)} = \frac{x^2+10x+12}{3(x+1)(x-2)}$$

$$5) \frac{18b+36}{21b^3+42b^2} \div \frac{6}{b^2-4b-12}$$

$$\frac{3 \cdot 6(b+2)}{7 \cdot 3b^2(b+2)} \cdot \frac{(b-b)(b+2)}{1 \cdot 6}$$

$$= \frac{(b+2)(b-6)}{7b^2}$$

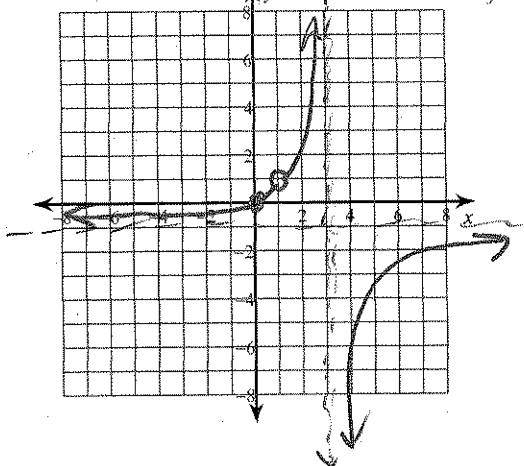
$$6) \frac{4x-4}{4x-20} \div \frac{7x+63}{7}$$

$$\frac{4(x-1)}{4(x-5)} \cdot \frac{7}{7(x+9)}$$

$$= \frac{x-1}{(x-5)(x+9)}$$

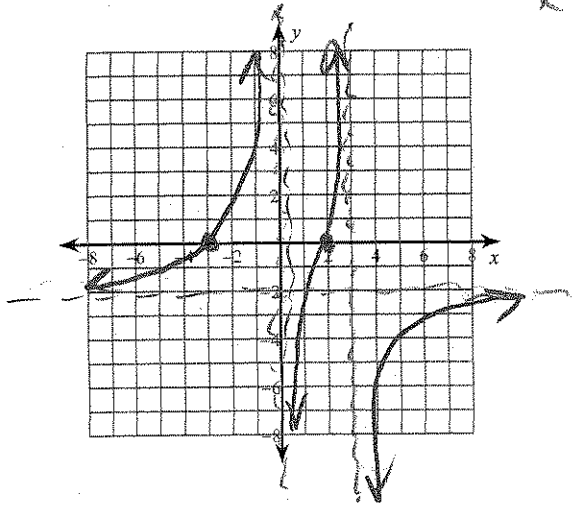
Identify the holes, vertical asymptotes, x-intercepts, y-intercepts, and horizontal asymptote of each. Then sketch the graph.

$$7) f(x) = \frac{x^2 - x}{-x^2 + 4x - 3} = \frac{x(x-1)}{-1(x-1)(x-3)} = \frac{x}{-1(x-3)}$$



Hole @ $x = 1$
 x-int: $(0, 0)$
 V. Asym. $x = 3$
 y-int: $(0, 0)$
 H. Asym: $y = \frac{1}{3}$

$$8) f(x) = \frac{-2(x^2 + x - 6)}{-2x^2 - 2x + 12} = \frac{-2(x+3)(x-2)}{x(x-3)}$$



x-int: $(-3, 0) + (2, 0)$
 V. Asym: $x = 0 + x = 3$
 y-int: None
 H. Asym: $y = -2$

$x = 0.5 \rightarrow y = \text{negative}$
 +

$x = 2.5 \rightarrow y = \text{positive}$

Solve each equation. Round your answers to the nearest ten-thousandth.

$$9) \frac{-8 \cdot 10^{n-2}}{-8} = \frac{-6}{-8}$$

$$10^{n-2} = \frac{3}{4} \quad \text{Definition!}$$

$$\log_{+2} \frac{3}{4} = n-2$$

$$\log\left(\frac{3}{4}\right) + 2 = n \approx 1.8751$$

$$10) 8e^{b+8} - 9 = 89$$

$$\frac{8e^{b+8}}{8} = \frac{98}{8}$$

$$e^{b+8} = \frac{49}{4} \quad \text{Definition!}$$

$$\ln \frac{49}{4} = b+8$$

$$b = \ln\left(\frac{49}{4}\right) - 8$$

$$b \approx -5.4944$$

Solve each equation.

$$11) \log(x+9) - \log 7 = 1$$

$$\log \frac{x+9}{7} = 1$$

$$7 \cdot 10^1 = \frac{x+9}{7} \cdot 7$$

$$70 = x+9$$

$$x = 61$$

Condense each expression to a single logarithm.

$$13) 5 \log_5 11 - 2 \log_5 2$$

$$\log_5 \frac{11^5}{2^2}$$

$$12) \log_8 2x^2 + \log_8 2 = 4$$

$$\log_8 4x^2 = 4$$

$$8^4 = 4x^2$$

$$\frac{4096}{4} = \frac{4x^2}{4}$$

$$\sqrt{1024} = x^2$$

$$x = \pm 32$$

Expand each logarithm.

$$14) \log \left(\frac{x}{y^2} \right)^5$$

$$5 \log x - 10 \log y$$

