

Chapter 8 Review

Simplify each expression.

$$1) \frac{48n}{56n+64} = \frac{48n}{8(7n+8)}$$

$$\boxed{\frac{6n}{7n+8}}$$

$$2) \frac{x^2-15x+56}{x-7} = \frac{(x-7)(x-8)}{x-7}$$

$$\boxed{x-8}$$

Simplify each and state the excluded values.

$$3) \frac{5a^2-20a}{a-4} = \frac{5a(a-4)}{a-4}$$

$$\boxed{5a}$$

$$a-4=0$$

$$\boxed{a \neq 4}$$

$$4) \frac{a-10}{a^2-18a+80} = \frac{a-10}{(a-10)(a-8)}$$

$$\boxed{\frac{1}{a-8}}$$

$$a-10=0$$

$$\boxed{a \neq 10}$$

$$a-8=0$$

$$\boxed{a \neq 8}$$

Simplify each expression.

$$5) \frac{4}{p^2-7p+12} + \frac{p-5}{p^2-7p+12} = \frac{p-1}{p^2-7p+12}$$

$$6) \frac{6m}{12m^2+36m} - \frac{m-1}{12m^2+36m} = \frac{5m+1}{12m^2+36m}$$

$$7) \frac{2}{v-4} - \frac{6v}{2v+2}$$

$$\frac{2(2v+2) - 6v(v-4)}{(v-4)(2v+2)} = \frac{4v+4 - 6v^2+24v}{(v-4)(2v+2)}$$

$$\boxed{\frac{-6v^2+28v+4}{(v-4)(2v+2)}}$$

$$8) \frac{2n}{6n^2-10n} + \frac{2}{3n} = \frac{2n}{2n(3n-5)} + \frac{2}{3n}$$

$$\frac{3n}{3n(3n-5)} + \frac{2(3n-5)}{3n(3n-5)}$$

$$\frac{3n+6n-10}{3n(3n-5)} = \boxed{\frac{9n-10}{3n(3n-5)}}$$

$$9) \frac{1}{n+10} \cdot \frac{n^2-n-90}{n+9}$$

$$\frac{1}{n+10} \cdot \frac{(n-10)(n+9)}{\cancel{n+9}} = \boxed{\frac{n-10}{n+10}}$$

$$10) \frac{18x-18}{6} \cdot \frac{9x^2}{15x^2-15x}$$

$$\frac{3 \cancel{18}(x-1)}{1 \cancel{6}} \cdot \frac{3 \cancel{9}x^2}{5 \cancel{15}x(x-1)} = \frac{9x^2}{5x}$$

$$\boxed{\frac{9x}{5}}$$

$$11) \frac{5}{x-3} \div \frac{5}{8x-24} = \frac{\cancel{5}}{x-3} \cdot \frac{8x-24}{\cancel{5}}$$

$$\frac{8(\cancel{x-3})}{\cancel{x-3}} = \boxed{8}$$

$$12) \frac{7n}{n^2-7n-18} \div \frac{8n^2}{8n^3+16n^2}$$

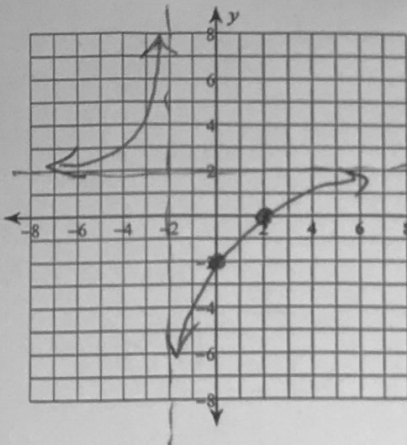
$$\frac{7n}{(n-9)(n+2)} \cdot \frac{\cancel{8n^2}(n+2)}{\cancel{8n^2}} = \boxed{\frac{7n}{n-9}}$$

$$13) \frac{\frac{x-1}{x^2}}{\frac{x-1}{x}} = \frac{\cancel{x-1}}{x^2} \cdot \frac{x}{\cancel{x-1}} = \boxed{\frac{1}{x}}$$

$$14) \frac{\frac{u^2}{5}}{\frac{3}{u}} = \frac{u^2}{5} \cdot \frac{u}{3} = \boxed{\frac{u^3}{15}}$$

Graph each function.

15) $f(x) = \frac{2x-4}{x+2}$



② No HOLE!

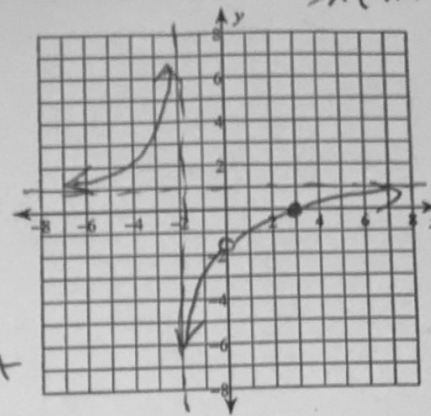
④ $x+2=0$
 $x=-2$ VA

⑤ $2x-4=0$
 $2x=4$ x-int
 $x=2$

⑥ $\frac{2(0)-4}{0+2} = \frac{-4}{2} = -2$
y-int

⑦ $y=2$ HBA.

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



② $x=0$
③ $\frac{0-3}{0+2} = \frac{-3}{2} = -1.5$
hole @ (0, -1.5)

④ $x+2=0$
 $x=-2$ VA.

⑤ $x-3=0$ x-int
 $x=3$

⑥ $\frac{0-3}{0+2} = \frac{-3}{2} = -1.5$
y-int

⑦ $y=1$ HBA.

Solve each equation. Remember to check for extraneous solutions.

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

$4x^2 \left(\frac{2}{4x^2} = \frac{x+3}{4x^2} - \frac{4}{4x^2} \right)$

$2 = x+3-4$

$2 = x-1$

$\boxed{3=x}$ ✓

18) $\frac{2}{v} = \frac{v+5}{v^2} + \frac{2v+6}{v^2}$

$v^2 \left(\frac{2v}{v^2} = \frac{v+5}{v^2} + \frac{2v+6}{v^2} \right)$

$2v = v+5 + 2v+6$

$2v = 3v+11$

$-v = 11$

$\boxed{v=-11}$ ✓

$$19) \frac{1}{r^2+3r} - \frac{1}{r} = \frac{3}{r^2+3r}$$

$$\frac{1}{r(r+3)} - \frac{1}{r} = \frac{3}{r(r+3)}$$

$$\times(r+3) \left(\frac{1}{r(r+3)} - \frac{r+3}{r(r+3)} = \frac{3}{r(r+3)} \right)$$

$$1 - r - 3 = 3$$

$$-r - 2 = 3$$

$$-r = 5$$

$$\boxed{r = -5} \checkmark$$

$$21) \frac{m-3}{m} = \frac{2}{m} - \frac{6}{m+6}$$

$$\cancel{m(m+6)} \left(\frac{(m-3)(m+6)}{m(m+6)} = \frac{2(m+6)}{m(m+6)} - \frac{6m}{m(m+6)} \right)$$

$$(m-3)(m+6) = 2(m+6) - 6m$$

$$m^2 + 3m - 18 = 2m + 12 - 6m$$

$$m^2 + 3m - 18 = -4m + 12$$

$$m^2 + 7m - 30 = 0$$

$$(m-3)(m+10) = 0$$

$$m-3=0 \quad m+10=0$$

$$\boxed{m=3} \checkmark \quad \boxed{m=-10} \checkmark$$

$$20) \frac{4v+1}{v-3} - \frac{1}{v-3} = 1$$

$$\times(v-3) \left(\frac{4v+1}{v-3} - \frac{1}{v-3} = \frac{v-3}{v-3} \right)$$

$$4v + 1 - 1 = v - 3$$

$$4v = v - 3$$

$$3v = -3$$

$$\boxed{v = -1} \checkmark$$

$$22) \frac{1}{r+6} = \frac{2}{r^2+4r-12} - \frac{2r-5}{r+6}$$

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

$$\times(r+6) \left(\frac{r-2}{(r-2)(r+6)} = \frac{2}{(r-2)(r+6)} - \frac{(r-2)(2r-5)}{(r-2)(r+6)} \right)$$

$$r-2 = 2 - (r-2)(2r-5)$$

$$r-2 = 2 - (2r^2 - 9r + 10)$$

$$r-2 = 2 - 2r^2 + 9r - 10$$

$$r-2 = -2r^2 + 9r - 8$$

$$0 = -2r^2 + 8r - 6$$

$$0 = -2(r^2 - 4r + 3)$$

$$0 = -2(r-3)(r-1)$$

$$r-3=0 \quad r-1=0$$

$$\checkmark \boxed{r=3} \checkmark \boxed{r=1}$$