

6.3 and 6.5 Review

Simplify each expression.

$$1) \frac{x-3}{x+1} + \frac{4x}{3} \cdot \frac{(x+1)}{(x+1)}$$

$$\frac{3x-9}{3(x+1)} + \frac{4x^2+4x}{3(x+1)} = \boxed{\frac{4x^2+7x-9}{3(x+1)}}$$

$$2) \frac{4n}{n-2} + \frac{-6n(n-2)}{2(n-2)}$$

$$\frac{8n}{2(n-2)} + \frac{-6n^2+12n}{2(n-2)}$$

$$\boxed{\frac{-6n^2+20n}{2(n-2)}}$$

$$3) \frac{6r}{3r+1} + \frac{6r}{r+2} \cdot \frac{(3r+1)}{(3r+1)}$$

$$\frac{6r^2+12r}{(r+2)(3r+1)} + \frac{18r^2+6r}{(r+2)(3r+1)} =$$

$$\boxed{\frac{24r^2+18r}{(r+2)(3r+1)}}$$

$$5) \frac{5k}{5} + \frac{-6k}{3k+2} \cdot \frac{(5)}{(5)}$$

$$\frac{15k^2+10k}{5(3k+2)} + \frac{-30k}{5(3k+2)} = \boxed{\frac{15k^2-20k}{5(3k+2)}}$$

$$4) \frac{2}{2x-5} + \frac{-5}{2x-5} \cdot \frac{(5)}{(5)}$$

$$\frac{4x-10}{5(2x-5)} + \frac{-25}{5(2x-5)} = \boxed{\frac{4x-35}{5(2x-5)}}$$

$$6) \frac{\frac{x}{4}}{\frac{x+5}{16}}$$

$$\frac{x}{4} \cdot \frac{16}{x+5} = \boxed{\frac{4x}{x+5}}$$

$$7) \frac{\frac{x+3}{4}}{\frac{x^2+2x-3}{24}}$$

$$\frac{x+3}{4} \cdot \frac{24}{x^2+2x-3} = \boxed{\frac{6}{x-1}}$$

$$8) \frac{\frac{5}{u}}{\frac{25}{u^2}}$$

$$\frac{5}{u} \cdot \frac{u^2}{25} = \boxed{\frac{u}{5}}$$

$$9) \frac{\frac{9}{x}}{\frac{x}{2}}$$

$$\frac{9}{x} \cdot \frac{2}{x} = \boxed{\frac{18}{x^2}}$$

Solve each equation or inequality.

$$10) \frac{x^2+x-30}{x+4} = x+2 + \frac{4x-8}{x+4}$$

$$x^2+x-30 = x^2+4x+2x+8+4x-8$$

$$\cancel{x^2}+x-30 = \cancel{x^2}+10x$$

$$x-30=10x$$

$$-30=9x$$

$$x = -30/9 = \boxed{-10/3}$$

$$12) \frac{1}{4m} - 1 = \frac{3}{2m}$$

$$1 - 4m = 6$$

$$-4m = 5$$

$$\boxed{m = -5/4}$$

$$11) m-3 = \frac{6m}{m+6} + \frac{3m+9}{m+6}$$

$$m^2+6m-3m-18 = 6m-3m-9$$

$$m^2+3m-18 = 3m-9$$

$$m^2-9=0$$

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

$$\boxed{m = \pm 3}$$

$$13) \frac{1}{2b^2} + \frac{1}{2b} = \frac{5}{2b^2}$$

$$1 + b = 5$$

$$\boxed{b = 4}$$

$$14) \frac{3k+18}{5k} = \frac{1}{k} + 1$$

$$3k+18=5+5k$$

$$13=2k$$

$$\boxed{k = 13/2}$$

$$15) \frac{3}{x} = \frac{1}{3x} + \frac{-x+2}{3x}$$

$$9 = 1 - x + 2$$

$$9 = 3 - x$$

$$6 = -x$$

$$\boxed{x = -6}$$