

6.1 ex  $\frac{(-3x)^2}{4x+12}$   $x=2 \rightarrow \frac{(-3 \cdot 2)^2}{4(2)+12} = \frac{36}{8+12}$   
 $= \frac{36}{20} = \frac{9}{5}$

$x=-3 \rightarrow \frac{(-3(-3))^2}{4(-3)+12} = \frac{81}{-12+12} = \frac{81}{0}$   
 Undefined

ex  $\frac{-7}{3x}$   $3x \neq 0$   
 $\frac{3}{3} \quad \frac{3}{3}$   
 $x \neq 0$

ex  $\frac{m-2}{m-5}$   $m-5 \neq 0$   
 $+5 \quad +5$   
 $m \neq 5$

$$\underline{\text{ex}} \quad \frac{x^2 - 4x}{6} \quad 6 \neq 0$$

it is never undefined

$$\underline{\text{ex}} \quad \frac{27p^2}{3p} = 9p$$

$$\underline{\text{ex}} \quad \frac{15(\cancel{m-1})}{9(\cancel{m-1})} = \frac{5}{3}$$

$$\underline{\text{ex}} \quad \frac{(\cancel{t+5})(t-3)}{(t-1)(\cancel{t+5})} = \frac{t-3}{t-1}$$

$$\underline{\text{ex}} \quad \frac{a^2 - b^2}{a - b} = \frac{(a + b)(\cancel{a - b})}{\cancel{a - b}} = a + b$$

$$\underline{\text{ex}} \quad \frac{5s - 25}{s^2 - 25} = \frac{5(\cancel{s - 5})}{(\cancel{s - 5})(s + 5)} = \frac{5}{s + 5}$$

$$\underline{\text{ex}} \quad \frac{y^2 - 5y - 14}{y^2 + y - 2} = \frac{(y - 7)(\cancel{y + 2})}{(\cancel{y + 2})(y - 1)} = \frac{y - 7}{y - 1}$$

$$\text{ex } \frac{3x^2 + 8x + 4}{3x^2 - 4x - 4} = \frac{(x+2)(\cancel{3x+2})}{(x-2)(\cancel{3x+2})} = \frac{x+2}{x-2}$$

$$3 \cdot 4 = 12$$

$$8 = 6 \cdot 2$$

$$3x^2 + 6x + 2x + 4$$

$$3x(x+2) + 2(x+2)$$

$$3(-4) = -12$$

$$-4 = -6 + 2$$

$$3x^2 - 6x + 2x - 4$$

$$3x(x-2) + 2(x-2)$$

$$\begin{aligned}\frac{\text{ex}}{\quad} \frac{km + 4k + 4m + 16}{km + 4k + 5m + 20} &= \frac{k(m+4) + 4(m+4)}{k(m+4) + 5(m+4)} \\ &= \frac{\cancel{(m+4)}(k+4)}{\cancel{(m+4)}(k+5)} = \frac{k+4}{k+5}\end{aligned}$$

$$\begin{aligned}\frac{\text{ex}}{\quad} \frac{x^2y + y + x^2z + z}{xy + xz} &= \frac{y(x+1) + z(x+1)}{x(y+z)} \\ &= \frac{(x+1)\cancel{(y+z)}}{x\cancel{(y+z)}} = \frac{x+1}{x}\end{aligned}$$

$$\underline{\text{ex}} \quad \frac{2-k}{k-2} = \frac{-1(\cancel{k-2})}{\cancel{k-2}} = -1$$

$$\underline{\text{ex}} \quad \frac{a^2-b^2}{b-a} = \frac{(a+b)(\cancel{a-b})}{-1(\cancel{a-b})} = \frac{a+b}{-1} = -\frac{a}{-1} + \frac{b}{-1}$$

$$= -a - b$$

or  $-1(a+b)$

$$\underline{\text{ex}} \quad \frac{5-x}{5+x} \quad \text{in lowest terms}$$

$$\underline{\text{ex}} \quad - \frac{x+6}{x-1} = \frac{-(x+6)}{x-1}, \quad \frac{-x-6}{x-1}, \quad \frac{x+6}{-(x-1)}, \quad \frac{x+6}{-x+1}$$

6.2

$$\underline{\text{ex}} \quad \frac{\overset{1}{\cancel{27}}k^3}{\underset{3}{\cancel{9}}k} \cdot \frac{\overset{8}{\cancel{24}}}{\underset{3}{\cancel{9}}k^2} = 8$$

$$\text{ex } \frac{6^3}{12m^5} \cdot \frac{6m^6}{28m^3} = \frac{9m^6}{-7}$$

~~1~~      ~~4~~  
 -1      7

$$\text{ex } \frac{4(y-2)^2}{x} \cdot \frac{1}{8(y-2)^2} = \frac{2}{y-2}$$

~~x~~  
~~8~~  
 x  
 1



$$\text{ex } \frac{\cancel{z+9}}{\cancel{4} \cdot 2} \cdot \frac{1}{\cancel{z+9}} z^2 = \frac{z^2}{4}$$

$$\text{ex } \frac{35q^8}{9q^5} \div \frac{25q^6}{10q^5} = \frac{\cancel{35}q^8}{9q^5} \cdot \frac{2}{\cancel{10}q^5} \cdot \frac{1}{\cancel{25}q^6} = \frac{14q^2}{9}$$

$$\text{ex } \frac{4m+16}{10} \div \frac{3m+12}{18} = \frac{4m+16}{10} \cdot \frac{18}{3m+12}$$

$$= \frac{\cancel{4}(m+4)}{\cancel{10} \cdot 5} \cdot \frac{\cancel{18}^6}{\cancel{3}(m+4)} = \frac{12}{5}$$

$$\underline{\text{ex}} \quad \frac{y^2}{y+1} \div \frac{3y}{y+3} = \frac{y^{\cancel{2}}}{y+1} \cdot \frac{y+3}{\cancel{3}y} = \frac{y(y+3)}{y+1}$$

$$\underline{\text{ex}} \quad \frac{8r+16}{24r-24} \cdot \frac{6r-6}{3r+6} = \frac{\overset{1}{\cancel{8}(r+2)}}{\underset{3}{\cancel{24}(r-1)}} \cdot \frac{\overset{2}{\cancel{6}(r-1)}}{\underset{1}{\cancel{3}(r+2)}} = \frac{2}{3}$$

$$\underline{\text{ex}} \quad \frac{2m^2-5m-12}{m^2+m-20} \div \frac{4m^2-9}{m^2+4m-5}$$

$$= \frac{2m^2-5m-12}{m^2+m-20} \cdot \frac{m^2+4m-5}{4m^2-9} = \frac{\cancel{(2m+3)}\cancel{(m-4)}(m-1)\cancel{(m+5)}}{\cancel{(m+5)}\cancel{(m-4)}\cancel{(2m+3)}\cancel{(2m-3)}}$$

$$= \frac{m-1}{2m-3}$$

$$\text{ex } \frac{r^2+r-6}{r^2+4r-12} \div \frac{r+3}{r-1} = \frac{r^2+r-6}{r^2+4r-12} \cdot \frac{r-1}{r+3} =$$

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

$$\text{ex } \frac{m-8}{m-4} \div \left( \frac{m^2-12m+32}{8m} \cdot \frac{m^2-8m}{m^2-8m+16} \right)$$

$$= \frac{m-8}{m-4} \div \left( \frac{\cancel{(m-4)}(m-8)}{8m} \cdot \frac{m\cancel{(m-8)}}{\cancel{(m-4)}(m-4)} \right)$$

$$= \frac{\cancel{m-8}}{\cancel{m-4}} \cdot \frac{8\cancel{(m-4)}}{(m-8)\cancel{8}} = \frac{8}{m-8}$$