

6.2: Multiplying / Dividing Rationals

Recall: Multiply fractions

$$1) \quad \frac{2}{3} \cdot \frac{2}{5} = \frac{4}{15}$$

$$2) \quad 5 \left(\frac{2}{3} \right) = \frac{10}{3}$$

Back to Rationals...

$$1) \frac{a^2 - a - 12}{a^2 - 9} \cdot \frac{a^2 - 4a + 3}{a^2 - 4a}$$

Factor First!

List non-permissible values

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

$$a \neq \pm 3, 0, 4$$

$$\Rightarrow \frac{(a-1)}{a}$$

$$2) \frac{10x+15}{10x-50} \cdot \frac{x^2-25}{6x+9}$$

$$\frac{5 \cancel{(2x+3)}}{10 \cancel{(x-5)}} \cdot \frac{\cancel{(x-5)}(x+5)}{3 \cancel{(2x+3)}}$$

$$x \neq 5, -\frac{3}{2}$$

$$\begin{aligned} 2x+3 &\neq 0 \\ 2x &\neq -3 \\ x &\neq -\frac{3}{2} \end{aligned}$$

$$\frac{5(x+5)}{30} = \frac{(x+5)}{6}$$

$$3. \frac{m}{m-5} \cdot \frac{m^2-6m+5}{m^2-1} \cdot \frac{m^2-4m-5}{m^2-5m}$$

$$\frac{\cancel{m}}{\cancel{(m-5)}} \cdot \frac{\cancel{(m-1)}\cancel{(m-5)}}{\cancel{(m+1)}\cancel{(m-1)}} \cdot \frac{\cancel{(m+1)}\cancel{(m-5)}}{\cancel{m}\cancel{(m-5)}}$$

$$m \neq 5, \pm 1, 0$$

$$= 1$$

