

## Chapter 2C: Rational Functions

2C.1

Today you will simplify rational functions.

Rational Function is a function  
in the form

$$f(x) = \frac{N(x)}{D(x)}$$

where

$N$  and  $D$  are both polynomials

The domain of  $f$  is all  $x$  such that  
 $D(x) \neq 0$ .

$$\textcircled{2.} \quad \frac{\overset{1}{1}6r^2}{\underset{1}{1}6r^3} = \boxed{\frac{1}{r}}$$

$$\textcircled{6.} \quad \frac{\overset{1}{1}5x}{\underset{2}{2}30n^2} = \boxed{\frac{1}{2n^2}}$$

$$\textcircled{4.} \quad \frac{\overset{4}{4}2n^2}{\underset{3}{3}24n} = \boxed{\frac{4n}{3}}$$

$$\textcircled{8.} \quad \frac{\underline{45}}{\underline{10a-10}} = \frac{\overset{9}{9}5}{\underset{2}{2}5(a-1)} = \boxed{\frac{9}{2(a-1)}}$$

$$\textcircled{10.} \quad \frac{15a-3}{24} = \frac{\cancel{3}(5a-1)}{\cancel{24}_8}$$

$$= \boxed{\frac{5a-1}{8}}$$

$$\textcircled{12.} \quad \frac{x+6}{x^2+5x-6}$$

$$= \frac{\cancel{(x+6)}}{\cancel{(x+6)}(x-1)}$$

$$= \boxed{\frac{1}{x-1}}$$

$$\begin{array}{r} -6 \\ 6 \end{array} \begin{array}{r} -1 \\ -1 \\ 5 \end{array}$$

$$\textcircled{14.} \quad \frac{v^2-7v-30}{v^2-5v-24} = \frac{(v-10)\cancel{(v+3)}}{(v-8)\cancel{(v+3)}}$$

$$= \boxed{\frac{v-10}{v-8}}$$

$$\begin{array}{r} -30 \\ -10 \\ -7 \end{array} \begin{array}{r} 1 \cdot 30 \\ 2 \cdot 15 \\ 3 \cdot 10 \end{array}$$

$$\begin{array}{r} -24 \\ -8 \\ -5 \end{array} \begin{array}{r} 1 \cdot 24 \\ 2 \cdot 12 \\ 3 \cdot 8 \end{array}$$

(22.)

$$\frac{x^3 - x^2 - 42x}{2x^2 - 20x + 42} = \frac{x(x^2 - x - 42)}{2(x^2 - 10x + 21)}$$

$$\begin{array}{ccc} & -42 & \\ -7 & \times & +6 \\ & -1 & \end{array}$$

$$\begin{array}{ccc} & 21 & \\ -7 & \times & -3 \\ & -10 & \end{array}$$

$$= \frac{x(x/\cancel{7})(x+6)}{2(x-\cancel{7})(x-3)}$$

$$= \boxed{\frac{x(x+6)}{2(x-3)}}$$