

# M3 Simplifying Polynomials

- ①  $\frac{18x}{45x^2-72x} = \frac{2 \cdot 18x}{9x(5x-8)} = \frac{2}{5x-8}$
- ②  $\frac{x+4}{5x^2-12x-32} = \frac{(x+4)}{(5x-8)(x+4)} = \frac{1}{5x-8}$
- ③  $\frac{6x+60}{x+10} = \frac{6(x+10)}{x+10} = \frac{6}{1} = 6$
- ④  $\frac{m+1}{2m+2} = \frac{m+1}{2(m+1)} = \frac{1}{2}$
- ⑤  $\frac{3m^2+31m+10}{m+10} = \frac{(3m+1)(m+10)}{m+10} = 3m+1$
- ⑥  $\frac{27x^3}{27x^2-54x} = \frac{27x^3}{27x(x-2)} = \frac{x^2}{x-2}$
- ⑦  $\frac{70n^2}{50n-30} = \frac{70n^2}{10(5n-3)} = \frac{7n^2}{5n-3}$
- ⑧  $\frac{63}{18x-9} = \frac{63}{9(2x-1)} = \frac{7}{2x-1}$
- ⑨  $\frac{x^2-16}{x+4} \cdot \frac{7x}{x-4} = \frac{(x-4)(x+4)}{x+4} \cdot \frac{7x}{x-4} = 7x$
- ⑩  $\frac{1}{r-7} \cdot \frac{r^2-13r+42}{9} = \frac{1}{r-7} \cdot \frac{(r-7)(r-6)}{9} = \frac{r-6}{9}$
- ⑪  $\frac{n^2-14n+40}{n-4} \cdot \frac{7}{80-8n} = \frac{(n-4)(n-10)}{(n-4)8(10-n)} \cdot \frac{7}{8(10-n)}$   
*\*these binomials are almost identical! take out a GCF of "-1" from denominator*  
 $\frac{7(n-10)}{8(10-n)} \cdot \frac{7}{8(10-n)}$   
*\*rearrange the binomial in the denominator*  
 $\frac{7(n-10)}{-8(-10+n)} = \frac{7(n-10)}{-8(n-10)}$   
 $\frac{-7}{8}$  *\*float negative sign up*
- ⑫  $\frac{8r}{10r+4} \cdot \frac{10r+4}{2} = \frac{8r}{2(5r+2)} \cdot \frac{2(5r+2)}{2} = \frac{8r}{2} = 4r$  *\*reduce!*
- ⑬  $\frac{2x^2-4x-70}{3} \cdot \frac{1}{2x+10} = \frac{2(x^2-2x-35)}{3} \cdot \frac{1}{2(x+5)}$   
 $\frac{2(x-7)(x+5)}{3} \cdot \frac{1}{2(x+5)}$   
 $\frac{x-7}{3}$  *\*GCF factoring first!*
- ⑭  $\frac{8n^2-32n}{3} \cdot \frac{1}{8n} = \frac{8n(n-4)}{3} \cdot \frac{1}{8n} = \frac{n-4}{3}$
- ⑮  $\frac{4x-20}{9x^2} \cdot \frac{10}{20x-100} = \frac{4(x-5)}{9x^2} \cdot \frac{10}{20(x-5)} = \frac{40}{180x^2} = \frac{2}{9x^2}$  *\*reduce!*
- ⑯  $\frac{n+3}{3n+6} \cdot \frac{6n^2-18n-60}{2n-10} = \frac{n+3}{3(n+2)} \cdot \frac{6(n^2-3n-10)}{2(n-5)} = \frac{n+3}{3(n+2)} \cdot \frac{6(n-5)(n+2)}{2(n-5)} = n+3$

$$\textcircled{17} \frac{n+10}{2n-20} \div \frac{1}{2n-20}$$

$$\frac{n+10}{2(n-10)} \cdot \frac{2(n-10)}{1}$$

$$n+10$$

$$\textcircled{18} \frac{6n}{6n^2+48n} \div \frac{1}{8n^2}$$

$$\frac{6n}{6n(n+8)} \cdot \frac{8n^2}{1}$$

$$\frac{8n^2}{n+8}$$

$$\textcircled{19} \frac{28x^2-20x}{4x} \div \frac{70x-50}{2}$$

$$\frac{4x(7x-5)}{4x} \cdot \frac{2}{10(7x-5)}$$

$$\frac{1}{5}$$

$$\textcircled{20} \frac{1}{a-10} \div \frac{10}{4a-40}$$

$$\frac{1}{a-10} \cdot \frac{4(a-10)}{10}$$

$\frac{4}{10}$  reduce!

$$\frac{2}{5}$$

$$\textcircled{21} \frac{10x^2+90x}{3x-3} \div \frac{1}{3x-3}$$

$$\frac{10x(x+9)}{3(x-1)} \cdot \frac{3(x-1)}{1}$$

$$10x(x+9)$$

$$\textcircled{22} \frac{8p^2-20p}{4p} \div \frac{2p-5}{7}$$

$$\frac{4p(2p-5)}{4p} \cdot \frac{7}{(2p-5)}$$

$$7$$

$$\textcircled{23} \frac{8}{7b+8} \div \frac{8}{49b^3+56b^2}$$

$$\frac{8}{7b+8} \cdot \frac{7b^2(7b+8)}{8}$$

$$7b^2$$

$$\textcircled{24} \frac{x+7}{x-6} \div \frac{45x+9}{5x+1}$$

$$\frac{x+7}{x-6} \cdot \frac{5x+1}{9(5x+1)}$$

$$\frac{x+7}{9(x-6)}$$