

mat0012c Chapter 3 Review  
Solutions to Practice Problems

prime factorization

$$\textcircled{1} \quad 1450 = \boxed{2 \cdot 5^2 \cdot 29}$$

$$\begin{array}{r} 2 \overline{)1450} \\ 5 \overline{)725} \\ 5 \overline{)145} \\ \quad 29 \end{array}$$

$$\textcircled{2} \quad 480 = \boxed{2^5 \cdot 3 \cdot 5}$$

$$\begin{array}{r} 2 \overline{)480} \\ 2 \overline{)240} \\ 2 \overline{)120} \\ 2 \overline{)60} \\ 2 \overline{)30} \\ 3 \overline{)15} \\ \quad 5 \end{array}$$

$$\textcircled{3} \quad 575 = \boxed{5^3 \cdot 23}$$

$$\begin{array}{r} 5 \overline{)575} \\ 5 \overline{)115} \\ \quad 23 \end{array}$$

Simplify

$$\textcircled{1} \quad \frac{12}{28} = \frac{\cancel{2} \cdot \cancel{2} \cdot 3}{\cancel{2} \cdot \cancel{2} \cdot 7} = \boxed{\frac{3}{7}}$$

$$\textcircled{2} \quad \frac{15}{27} = \frac{\cancel{3} \cdot 5}{\cancel{3} \cdot 3 \cdot 3} = \boxed{\frac{5}{9}}$$

simplify (continued)

$$\textcircled{3} \quad \frac{25x}{75x^2} = \boxed{\frac{1}{3x}}$$

$$\textcircled{4} \quad \frac{36y^3}{72y} = \boxed{\frac{y^2}{2}}$$

$$\textcircled{5} \quad \frac{18xyz}{23xy} = \boxed{\frac{18z}{23}}$$

$$\begin{aligned} \textcircled{6} \quad \frac{42ab^2c}{30abc^3} &= \frac{\cancel{2} \cdot \cancel{3} \cdot 7 \cancel{a} b^2 c}{\cancel{2} \cdot \cancel{3} \cdot 5 \cancel{a} b c^3} \\ &= \boxed{\frac{7b}{5c^2}} \end{aligned}$$

Multiply

$$\textcircled{1} \quad \frac{3}{5} \cdot \frac{1}{2} = \boxed{\frac{3}{10}}$$

$$\textcircled{2} \quad \frac{7}{8x} \cdot \frac{1}{3} = \boxed{\frac{-7}{12x}}$$

# multiply (continued)

$$\textcircled{3} \quad \frac{-24x^3}{5} \cdot \frac{-15^3}{8x^3} = \boxed{\frac{9}{x^2}}$$

$$\textcircled{4} \quad \left(-\frac{2}{3}\right)^3 = \left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right) = \boxed{\frac{-8}{27}}$$

$$\textcircled{5} \quad \frac{ac}{b} \cdot \frac{b^2}{a^3c} = \frac{ab^2c}{a^3bc} = \boxed{\frac{b}{a^2}}$$

$$\textcircled{6} \quad \frac{2x}{15x^2y} \cdot \frac{3xy}{4z} = \frac{\cancel{6}x^2y}{\cancel{6}x^2yz} = \boxed{\frac{1}{10z}}$$

## Divide

$$\textcircled{1} \quad -\frac{3}{4} \div \frac{3}{8} = -\frac{3}{4} \cdot \frac{8}{3} = \boxed{-2}$$

$$\textcircled{2} \quad \frac{18x}{5} \div \frac{2}{5x} = \frac{18x}{5} \cdot \frac{5x}{2} = \boxed{9x^2}$$

$$\textcircled{3} \quad -\frac{9}{2} \div -\frac{1}{3} = -\frac{9}{2} \cdot \frac{-3}{1} = \boxed{\frac{27}{2}}$$

$$\textcircled{4} \quad -\frac{5}{3} \div 2y = -\frac{5}{3} \cdot \frac{1}{2y} = \boxed{\frac{-5}{6y}}$$

$$\textcircled{5} \quad \frac{5x^2}{y} \div \frac{10x^3}{y^3} = \frac{5x^2}{y} \cdot \frac{y^3}{10x^3} = \boxed{\frac{y^2}{2x}}$$

$$\textcircled{6} \quad \frac{2x}{5} \div \frac{7}{10} = \frac{2x}{5} \cdot \frac{10}{7} = \boxed{\frac{4x}{7}}$$

$$\textcircled{7} \quad \frac{5x}{3y} \div \frac{15x^2}{6y} = \frac{5x}{3y} \cdot \frac{6y}{15x^2} = \boxed{\frac{2}{3x}}$$

# Areas of triangles & rectangles

①  $A = L \cdot w = \left(\frac{1}{3}\right) \left(\frac{4}{9}\right) = \frac{4}{15} \text{ in}^2$

②  $A = L \cdot w = \left(\frac{8}{3}\right) \left(\frac{5}{3}\right) = \frac{40}{9} \text{ ft}^2$

③  $A = \frac{1}{2}bh = \frac{1}{2} \left(\frac{1}{3}\right) \left(\frac{5}{8}\right) = \frac{5}{48} \text{ in}^2$

④  $A = \frac{1}{2}bh = \frac{1}{2} \left(\frac{4}{9}\right) \left(\frac{5}{9}\right) = \frac{4}{9} \text{ in}^2$

# Equations with fractions

①  $\frac{2}{9}y = -\frac{4}{3}$  lcd = 9

$9 \left(\frac{2}{9}y\right) = 9 \left(-\frac{4}{3}\right)$

$2y = -12$   
 $y = -6$

②  $\frac{x}{7} - 3 = -\frac{6}{7}$

lcd = 7

$7 \left(\frac{x}{7}\right) - 7(3) = 7 \left(-\frac{6}{7}\right)$

$x - 21 = -6$   
 $\quad \quad \quad +21 \quad \quad +21$

$x = 15$

③  $-\frac{2}{3}x = -\frac{4}{7}$  (lcd = 21)

$21 \left(-\frac{2}{3}x\right) = 21 \left(-\frac{4}{7}\right)$

$-14x = -12$   
 $x = \frac{12}{14} = \frac{6}{7}$

③  $\frac{y}{6} + 2 = \frac{11}{5}$  (lcd = 5)

$5 \left(\frac{y}{6}\right) + 5(2) = 5 \left(\frac{11}{5}\right)$

$y + 10 = 11$   
 $y = 1$

④  $\frac{x}{5} - \frac{5}{4} = \frac{x}{2} - \frac{1}{20}$

lcd = 20  
 $20 \left(\frac{x}{5}\right) - 20 \left(\frac{5}{4}\right) = 20 \left(\frac{x}{2}\right) - 20 \left(\frac{1}{20}\right)$

$4x - 25 = 10x - 1$   
 $\quad \quad \quad -4x \quad \quad \quad -4x$

$-25 = 6x - 1$   
 $-24 = 6x$

$-4 = x$

⑤  $\frac{3}{4}x = \frac{5}{8}$  (lcd = 8)

$8 \left(\frac{3}{4}x\right) = 8 \left(\frac{5}{8}\right)$

$6x = 5$

$x = \frac{5}{6}$