

### Questions

1. Multiply and simplify  $\left(-\frac{3}{5}\right)\left(-\frac{15}{11}\right)$ .
2. Multiply and simplify  $\left(\frac{12}{13}\right)\left(\frac{-5}{24}\right)$ .
3. Divide  $-36 \div (-9)$ .
4. Divide  $-48 \div (-8)$ .
5. Simplify  $\frac{-6}{-\frac{3}{7}}$ .
6. Simplify  $\frac{-2}{\frac{3}{15}}$ .
7. Simplify  $\left(-\frac{3}{4}\right)\left(-\frac{7}{15}\right)\left(-\frac{8}{21}\right)\left(-\frac{5}{9}\right)$ .

### Solutions

1.

$$\begin{aligned}\left(-\frac{3}{5}\right)\left(-\frac{15}{11}\right) &= \left(\frac{3}{5}\right)\left(\frac{15}{11}\right) \text{ multiplying two negatives gives a positive} \\ &= \frac{3 \times 15}{5 \times 11} \\ &= \frac{3 \times \cancel{5} \times 3}{\cancel{5} \times 11} \\ &= \frac{9}{11}\end{aligned}$$

2. Multiply and simplify  $\left(\frac{12}{13}\right)\left(\frac{-5}{24}\right)$ .

$$\begin{aligned}\left(\frac{12}{13}\right)\left(\frac{-5}{24}\right) &= -\left(\frac{12}{13}\right)\left(\frac{5}{24}\right) \text{ multiplying a negative and a positive gives a negative} \\ &= -\frac{12 \times 5}{13 \times 24} \\ &= -\frac{\cancel{12} \times 5}{13 \times 2 \times \cancel{12}} \\ &= -\frac{5}{26}\end{aligned}$$

3.

$$\begin{aligned}-36 \div (-9) &= \frac{-36}{-9} \\ &= \frac{36}{9} = 4\end{aligned}$$

4. Divide  $-48 \div (-8)$ .

$$\begin{aligned} -48 \div (-8) &= \frac{-48}{-8} \\ &= \frac{48}{8} = 6 \end{aligned}$$

5.

$$\begin{aligned} \frac{-6}{-\frac{3}{7}} &= (-6) \left( -\frac{7}{3} \right) \text{ instead of dividing, invert divisor and multiply} \\ &= (6) \left( \frac{7}{3} \right) \text{ overall sign is positive} \\ &= \frac{6 \times 7}{3} \\ &= \frac{2 \times \cancel{3} \times 7}{\cancel{3}} = 14 \end{aligned}$$

6. Simplify  $\frac{-2}{\frac{3}{8}}$ .

$$\begin{aligned} \frac{-2}{\frac{3}{8}} &= \left( \frac{-2}{3} \right) \left( \frac{15}{8} \right) \text{ instead of dividing, invert divisor and multiply} \\ &= - \left( \frac{2}{3} \right) \left( \frac{15}{8} \right) \text{ overall sign is negative} \\ &= - \frac{2 \times 15}{3 \times 8} \\ &= - \frac{\cancel{2} \times 5 \times \cancel{3}}{\cancel{3} \times \cancel{2} \times 4} = -\frac{5}{4} \end{aligned}$$

7.

$$\begin{aligned} \left( -\frac{3}{4} \right) \left( -\frac{7}{15} \right) \left( -\frac{8}{21} \right) \left( -\frac{5}{9} \right) &= \left( \frac{3}{4} \right) \left( \frac{7}{15} \right) \left( \frac{8}{21} \right) \left( \frac{5}{9} \right) \text{ overall sign is positive} \\ &= \frac{3 \times 7 \times 8 \times 5}{4 \times 15 \times 21 \times 9} \\ &= \frac{\cancel{3} \times \cancel{7} \times 2 \times \cancel{4} \times \cancel{5}}{\cancel{4} \times \cancel{3} \times \cancel{3} \times 3 \times \cancel{7} \times 9} \\ &= \frac{2}{27} \end{aligned}$$