

**3.4/3.5 – Multiplying/Dividing Rational Numbers**

Same signs → (+)      different signs → (-)

Recall that for multiplication and division:

- If there is an even number of negative signs (0, 2, 4, 6, etc.), the solution will be positive
- If there is an odd number of negative signs (1, 3, 5, etc.), the solution will be negative

When multiplying or dividing fractions, there is no need to create common denominators. You can, but you will have much more work to do simplifying your answer (lowest terms).

To multiply fractions:

- 1) Convert any mixed numbers to improper fractions.
- 2) Cross-cancel any common factors in the numerators and denominators (saves you work in step 4).
- 3) Multiply the numerators and multiply the denominators.
- 4) Be sure that your answer is fully simplified (lowest terms). If the answer is an improper fraction, convert it to a mixed number

Ex 1: Determine each product.

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

Method 1  
cross-cancel 1st!  

$$= (-\frac{1}{1})(-\frac{3}{4})$$

$$= \boxed{\frac{3}{4}}$$

Method 2  

$$= \frac{231 \div 7}{308 \div 7} = \frac{33 \div 11}{44 \div 11} = \boxed{\frac{3}{4}}$$

(b)  $(2\frac{2}{3})(-1\frac{5}{6})$

$$= \frac{18}{3} \times (-\frac{11}{6})$$

$$= \frac{-44}{9}$$

$$= -4\frac{8}{9}$$

(d)  $(-1.25)(-2.84)$

$$= \frac{-98 \div 2}{18 \div 2} = \frac{-44}{9}$$

(c)  $(0.8)(-2.4)$

estimate  
 $\approx 1 \times (-2) = \approx -2$

Alternative

$$= \frac{8}{10} \times (-2\frac{4}{10})$$

$$= \frac{18}{5} \times (-\frac{24}{5})$$

$$= \frac{-48}{25}$$

$$= -1\frac{234}{25 \times 4} = \boxed{-1.92}$$

Using calculator  
- answer must be positive

To divide fractions:

- 1) Convert any mixed numbers to improper fractions.
- 2) Multiply the dividend by the reciprocal of the divisor ("kiss and flip").
- 3) Follow the same procedure as for multiplying fractions.

Ex 2: Determine each quotient.

(a)  $\left(-\frac{5}{8}\right) \div \frac{3}{4}$

(b)  $\left(-4\frac{1}{5}\right) \div \left(-3\frac{1}{3}\right)$

(c)  $(-1.38) \div 0.6$

(d)  $-4 \div (-1.8)$

Ex. 3: On a particular day, the price of a share in CIBC decreased by \$1.640. A person owns 35 shares. By how much did those shares change in value that day?

$$\begin{array}{l} \underline{-1.640} \times 35 \text{ shares} \\ \text{share} \\ = \begin{array}{r} \underline{-1.640} \\ \times \quad 35 \\ \hline 8200 \\ 49200 \\ \hline \underline{-57.400} \end{array} \end{array}$$

$\boxed{\text{A} = -57.40}$

Assignment: Textbook P. 127 # 3ac, 4ac, 7, 9, 12cd