Multiplying Rational Numbers

What rules do we use to multiply integers?

Indicate if the answer will be **negative** or **positive**. How do you know?

(-4) x 3 = negative

-

(-3) x (-6) = positive

2 x 8 = positive

When multiplying integers , we use the following rules

Copy down

(-) x (+) = (-)

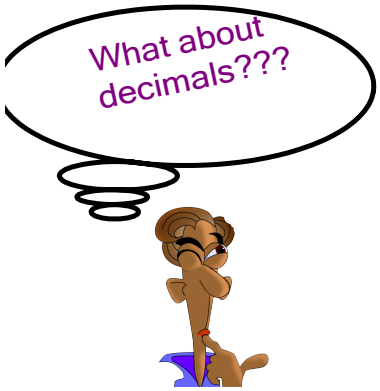
(-) x (-) = (+)

(+) x (+) = (+)

So, when the signs areopposite ,
the product is negative

and

when the signs are the same,
the product is positive!



When we have decimals use a calculator!

Example 1	Example 2
0.7 x (-1.5)	(-1.45) x (-3.56)
−1.05	5.162

Now, let's take a look at Fractions.

What rules do we use to multiply fractions?

Evaluate the following expression.

How did you get your answer?

$$\frac{6}{5} \times \frac{8}{7} = \frac{6 \times 8}{5 \times 7} = \frac{48}{35}$$

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When multiplying fractions, we use this rule:

(top numbers)

Multiply the numerator by the numerator

then

Multiply the denominator by the denominator

bottom numbers

** Then, of course, REDUCE!! (if possible)

When we use brackets to write a product,
we do not need the multiplication sign!

We can write

$\frac{3}{2} \times \left(-\frac{1}{5}\right)$ as $\left(\frac{3}{2}\right)\left(-\frac{1}{5}\right)$

AND

$(-1.5) \times 1.8$ as $(-1.5)(1.8)$

Try these out!

☆ Don't forget to ALWAYS reduce if possible!

Use what you know about multiplying integers & fractions to evaluate the following expressions.

$\left(\frac{7}{-4}\right) \times \frac{9}{2}$ $-\frac{63}{8}$	$9 \times (-3)$ -27	$\frac{9}{2} \times \left(\frac{-3}{10}\right)$ $-\frac{27}{20}$
(-1.5) x (-1.8) 2.7	0.2 x (-0.4) -0.08	$\left(-\frac{8}{3}\right) \times \left(-\frac{6}{5}\right)$ $+\frac{48}{15} = 3\frac{1}{5}$

Practice Questions
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Questions

3, 4, 5, 7

If you see decimals just use your calculator, don't bother predicting answers.

Multiplying Rational Numbers in Fraction Form

We should always try to reduce before we start the questions so we keep our numbers small

Look for common factors in the numerators and denominators.
11 and 44 have a common factor 11.
7 and 21 have a common factor 7.
Divide numerator and denominator by their common factors.

Determine the product:

$$\left(-\frac{11}{7}\right)\left(-\frac{21}{44}\right) = \frac{3}{4}$$

First, we simplify:

$$= \left(-\frac{\cancel{11}^{1}}{\cancel{7}_{1}}\right)\left(-\frac{\cancel{21}^{3}}{\cancel{44}_{4}}\right)$$

Then start multiplying

So, our new expression, looks like this:

$$= \frac{-1 \times -3}{1 \times 4}$$

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

$\left(\frac{-48}{15}\right)\left(\frac{35}{12}\right)$

$\left(\frac{-4}{3}\right)\left(\frac{7}{1}\right) = -\frac{28}{3}$

$-9\frac{1}{3}$

Multiplying Rational Numbers in mixed number Form

Determine the product.

$$\left(2\frac{2}{3}\right)\left(-1\frac{3}{4}\right)$$

Write the mixed numbers as improper fractions:

$$= \left(\frac{8}{3}\right)\left(-\frac{7}{4}\right)$$

$$= \left(\frac{{}^{2}\cancel{8}}{3}\right)\left(-\frac{7}{\cancel{4}_{1}}\right)$$

$$= \frac{(2)(-7)}{(3)(1)}$$

$$= \frac{-14}{3}$$

$$= -4\frac{2}{3}$$

$(-4\frac{2}{7})\quad(-5\frac{2}{3})$

$$\left(\frac{-30}{7}\right)\overset{3}{\cancel{\left(\frac{-17}{3}\right)}}$$

$$\left(\frac{-10}{7}\right)\left(\frac{-17}{1}\right)$$

$$= \frac{170}{7} = 24\frac{2}{7}$$

Multiplying Rational Numbers to Solve Problems

The price of a share in CIBC changed by -$1.57 on March 4th, 2008.
Linda owns 43 shares.
By how much did Linda's shares change on that day?

The change in value is represented by this expression:
-$1.57 x 43.

Use a calculator.

-$1.57 x 35 = - $67.51

The shares lost $67.51 that day.

Practice Questions
p. 128-129

Questions

3, 4, 5ab, 6,7, 9, 11, 12, 14,15, 16ab

Do not just write down answers show work. You don't have to rewrite word problems but for 11, 12 write out the questions (NOT JUST THE ANSWERS)