Curriculum Outcome

N1: Demonstrate an understanding of rational numbers by: comparing and ordering rational numbers; solving problems that involve arithmetic operations on rational numbers.

Student Friendly:
"Multiplying fractions and decimals "

Grade 9 Warm Up

5) Evaluate each of the following:

a) -21.25 + 3.25

= -18

b) -11.3 -(-2.4)

= -8.9

c) 7.35 + (-2.22)

= 5.13

d) -9.66 - (8.15)

= -17.81

Grade 9 Warm Up

6)   Evaluate each of the following:

a) $\dfrac{8}{3} + \dfrac{5}{4}$

$\dfrac{32}{12} + \dfrac{15}{12}$

$\dfrac{47}{12}$

$3\dfrac{11}{12}$

b) $-4\dfrac{2}{3} + \left(3\dfrac{1}{6}\right)$

$= \dfrac{-14}{3} + \dfrac{19}{6}$

$= \dfrac{-28}{6} + \dfrac{19}{6}$

$= \dfrac{-9}{6}$

$-1\dfrac{3}{6}$

$-1\dfrac{1}{2}$

Grade 9 Warm Up

c) $\dfrac{-1}{6} - \dfrac{2}{3}$

$= \dfrac{-1}{6} - \dfrac{4}{6}$

$= \dfrac{-5}{6}$

d) $2\dfrac{1}{7}\ \left(3\dfrac{2}{3}\right)$

$\dfrac{15}{7} + \dfrac{11}{3}$

$= \dfrac{45}{21} + \dfrac{77}{21}$

$= \dfrac{122}{21}$

$5\dfrac{17}{21}$

Section 3.4
Multiplying Rational Numbers

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 ,

(-) x (+) = (-)

Copy down

(+) x (-) = (-)

(-) x (-) = (+)

(+) x (+) = (+)

So, when the signs are opposite ,
the product is negative

and

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

3

What about decimals???

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?

Copy Down

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

When multiplying fractions, we use this rule:

Multiply the <u>numerator</u> by the <u>numerator</u>
then
Multiply the <u>denominator</u> by the <u>denominator</u>

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

$$\left(\frac{-3}{5}\right)\left(\frac{3}{16}\right)$$

$$\frac{-9}{80}$$

Multiplying Rational Numbers in Fraction Form

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

Determine the product:

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

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.

First, we simplify:

$$= \left(-\frac{\overset{-1}{\cancel{11}}}{\cancel{7}_1}\right)\left(-\frac{\overset{-3}{\cancel{21}}}{\cancel{44}_4}\right)$$

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

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

$$\frac{-11}{7} \times \frac{-21}{44}$$

$$\boxed{\frac{231}{308}}$$

231 $\boxed{a\,^b/_c}$ 308

$a \frac{b}{c}$

$\frac{\square}{\square}$

$$\frac{231}{308}$$

$231 \quad \boxed{a\frac{b}{c}} \quad 308$

$231 \llcorner 308$

$3/4$

$$\left(\frac{-16}{5}\right)\left(\frac{35}{12}\right)$$

$$\frac{-560}{60}$$

$\boxed{-560} \quad \boxed{a\frac{b}{c}} \quad 60$

$\boxed{\frac{-28}{3}}$

$$\left(\frac{\overset{-4}{-16}}{\underset{1}{5}}\right)\left(\frac{35}{\underset{3}{12}}\right)^{7}$$

$$\frac{-4}{1} \times \frac{7}{3}$$

$$= \frac{-28}{3}$$

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:

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

$$= \frac{-56}{12}$$

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

$$\frac{2}{3} \times \frac{-7}{1}$$

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

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

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

$$\frac{-10}{7} \times \frac{-17}{1}$$

$$\frac{170}{7}$$

$$= \frac{510}{21}$$
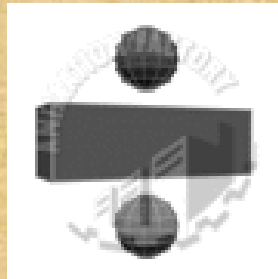
$$510 \quad \boxed{a\,b/c} \quad 21$$

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

$$\left(\frac{a^2 b^2}{c^4 d^2} \right) \times \left(\frac{c^4 d^3}{a b} \right)$$

$$a\, b^2\, c^4\, d^1$$

Sections 3.5

Dividing Fractions

Dividing Rational Numbers

Remember FRACTIONS are just numbers!

THUS

The properties are still the same.

$$(+) \div (+) = (+)$$

* When two rational numbers have the **same sign**, their quotient is **positive**.

$$(-) \div (-) = (+)$$

$$(+) \div (-) = (-)$$

* When two rational numbers have the **different signs**, their quotient is **negative**.

$$(-) \div (+) = (-)$$

Reciprocal

- Every **non-zero** fraction has a reciprocal.
- Fractions with a denominator of "0" are undefined. $\left(\dfrac{6}{0}\right)$
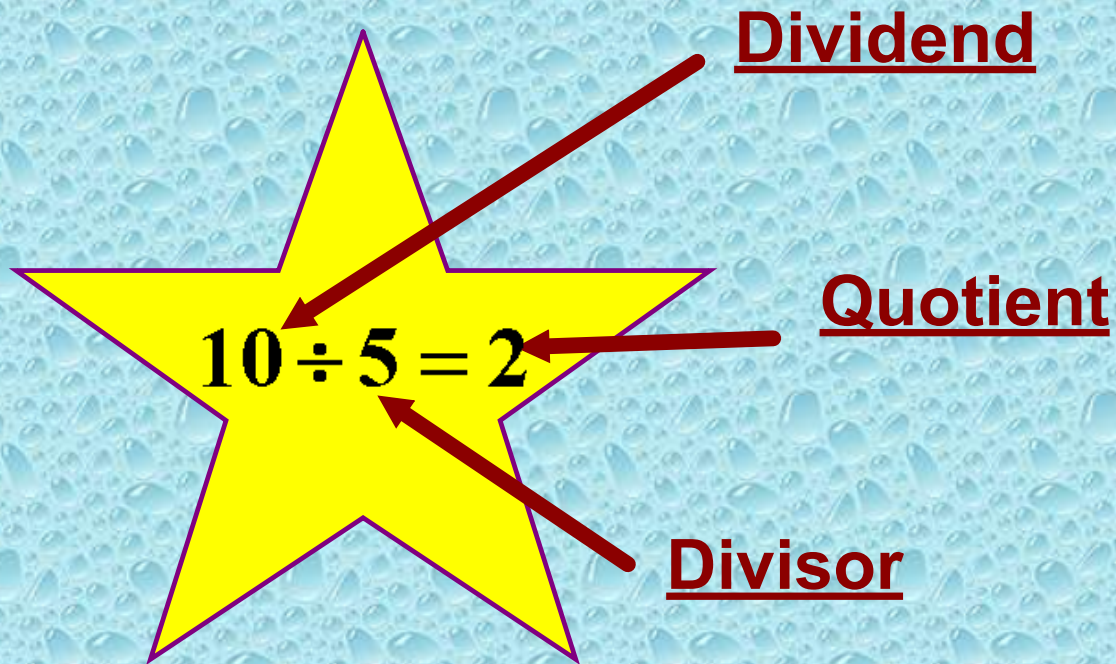- To find the **reciprocal** of a fraction, you simply **flip** the fraction !!

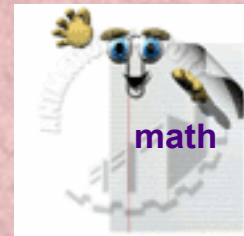$$\frac{4}{5} \qquad \frac{5}{4}$$

reciprocal

Terminology

Dividend

Quotient

Divisor

$$10 \div 5 = 2$$

Try These !!

math

#1

$$\frac{4}{5} \div \frac{7}{8} =$$

$$\frac{4}{5} \times \frac{8}{7}$$

$$= \frac{32}{35}$$

#2

$$\frac{1}{8} \div \frac{-6}{5}$$

$$\frac{1}{8} \times \frac{-5}{6}$$
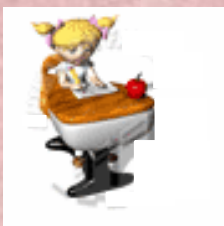
$$\frac{-5}{48}$$

#3

$$2\frac{1}{4} \div \frac{5}{1} =$$

$$\frac{9}{4} \times \frac{1}{5}$$

$$\frac{9}{20}$$

Try on your own

Remember: Must reduce when possible

Find the Quotient (Show work)

1)

$$\frac{3}{5} \div \frac{-7}{15}$$

$$\frac{3}{5} \times \frac{-15}{7}$$

$$\frac{-45}{35}$$

$$= \frac{-9}{7}$$

2)

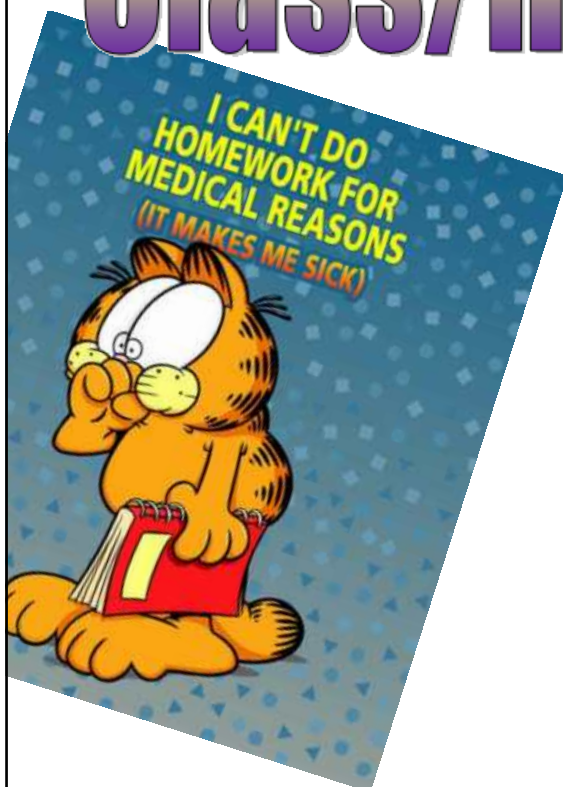$$\frac{-4}{27} \div \frac{-2}{3}$$

$$\frac{-4}{27} \times \frac{-3}{2}$$

$$\frac{12}{54}$$

$$= \frac{2}{9}$$

3)

10.4 $\div -5.2$

$$= -2$$

Class/Homework

Page 128 - 129

4 (abcd) , 5(abcd), 7(abcd)
11(abcd), 12(abcd), 15(ab)

and

Page 134 -136

3(ace),4(bdf), 9(acf),
13(cd), 12(abcdef)