

# D: Multiplying Improper Fractions & Mixed Numbers

## Review

1. Changing improper to mixed.

a.  $\frac{22}{3}$

How many times does 3 go into 22?

$$3 \times \boxed{7} = 21$$

3 goes into 22, 7 times.

$$22 - 21 = \boxed{1}$$

1 "left over"

Mixed:  $7\frac{1}{3}$

b.  $\frac{27}{2}$

How many times does 2 go into 27?

$$2 \times \boxed{13} = 26$$

2 goes into 27, 13 times.

$$27 - 26 = \boxed{1}$$

1 "left over"

Mixed:  $13\frac{1}{2}$

2. Changing mixed to improper.

a)  $8\frac{3}{4}$

$$4 \times 8 = 32$$

$$32 + 3 = 35$$

$\frac{35}{4}$

b)  $12\frac{1}{3}$

$$12 \times 3 = 36$$

$$36 + 1 = 37$$

$\frac{37}{3}$

## Multiplying

1. Change mixed to improper.
2. Cross reduce
3. TOP X TOP ; BOT X BOT
4. Reduce if you have to.

### Examples

1.  $4\frac{1}{2} \times 4\frac{1}{4}$

change to improper.

$$\frac{9}{2} \times \frac{17}{4}$$

can't cross reduce.

$$\boxed{\frac{153}{8}}$$

TOP X TOP ; BOT X BOT

2.  $2\frac{1}{5} \times 2\frac{1}{2}$

change to improper.

$$= \frac{11}{5} \times \frac{5}{2}$$

Cross reduce

$$= \frac{11}{8} \times \frac{5}{2}$$

TOP X TOP ; BOT X BOT

$$\boxed{= \frac{11}{2}}$$

3.  $4\frac{1}{5} \times 2\frac{2}{3}$

change to improper.

$$= \frac{21}{5} \times \frac{8}{3}$$

Cross reduce.

$$= \frac{21}{5} \times \frac{8}{3}$$

TOP X TOP ; BOT X BOT

$$\boxed{= \frac{56}{5}}$$

$$4. 12\frac{1}{2} \times 6\frac{1}{2}$$

change to improper.

$$= \frac{25}{2} \times \frac{13}{2}$$

can't cross reduce.

TOP x TOP; BOT x BOT

$$= \frac{325}{4}$$

$$5. 2\frac{1}{6} \times 2\frac{2}{5} \times 4\frac{2}{7}$$

change all to improper.

$$\frac{13}{6} \times \frac{12}{5} \times \frac{30}{7}$$

cross reduce

$$\frac{13}{\cancel{6}^2} \times \frac{\cancel{12}^2}{8} \times \frac{\cancel{30}^6}{7}$$

1      1

TOP x TOP x TOP; BOT x BOT x BOT

$$= \frac{156}{7}$$

Use a mixed number to complete.

$$6. 4\frac{1}{3} \times ? = 10\frac{5}{4}$$

change to improper.

$$\frac{13}{3} \times ? = \frac{65}{4}$$

$$\frac{13}{3} \times \frac{?}{?} = \frac{65}{4}$$

$$13 \times \text{what} = 65 \quad (5)$$

$$3 \times \text{what} = 6 \quad (2)$$

$$\frac{13}{3} \times \boxed{\frac{5}{2}} = \frac{65}{6}$$

Assignment Pg. 220 # 4-9, 20, 21

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