Technology-Integrated Mathematics
Class Notes
Fractions: Multiplication of Fractions (Section 2.2)

How do we find $\frac{1}{2}$ of $\frac{1}{3}$? First, we will look at a picture.

Now, we want $\frac{1}{2}$ of this $\frac{1}{3}$ that is pictured. Cut the shaded piece equally in half and shade one of the pieces. What fraction of the original area do we now have?

There are many applications where we need to multiply fractions.

Calculation-wise: If we multiply the fractions' tops and bottoms separately, we will get the $\frac{1}{6}$ we know to be the answer. Try it out here.

Mnemonic device: To find $\frac{1}{2}$ of $\frac{1}{3}$, we think of the "of" as "multiply".

expl 1: Multiply and write in lowest terms.
$$\frac{4}{7} \times \frac{5}{6}$$

We'll always want the final answer in lowest terms.

Two Different Methods (When Top and Bottom Have Common Factors):
　　　1. Multiply the fractions' tops and bottoms separately, *then* reduce to lowest terms.
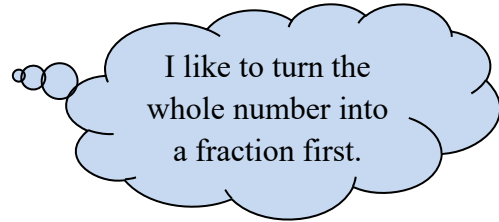
Try the method you did *not* do above.

　　　2. Reduce any common factors from top and bottom first, *then* multiply.
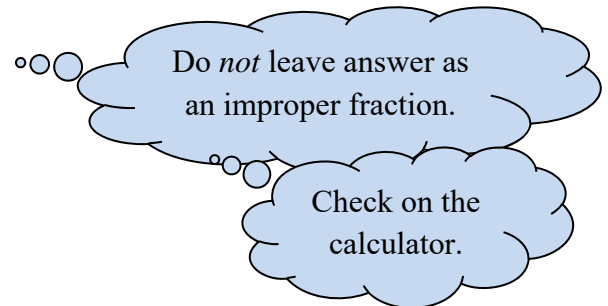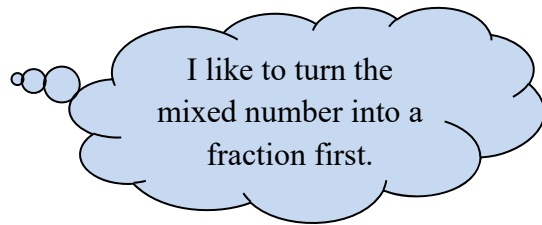
Which do you prefer?

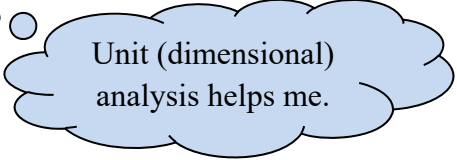expl 2: Multiply and write in lowest terms.

$$10 \times \frac{3}{4}$$

I like to turn the whole number into a fraction first.

expl 3: Multiply and write in lowest terms.

$$11 \tfrac{6}{7} \times \frac{7}{8}$$

I like to turn the mixed number into a fraction first.

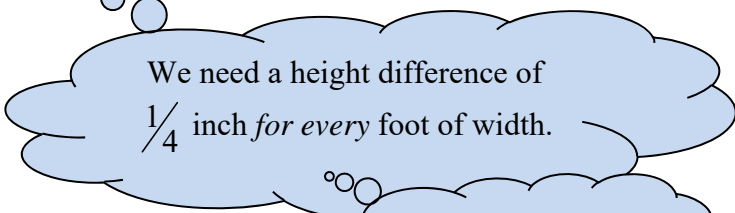Do *not* leave answer as an improper fraction.

Check on the calculator.

expl 4: How far will a nut advance if it is given 18 turns on a $\frac{1}{4}$-in. 20-NF (National Fine thread) bolt? (The designation 20-NF means the nut will advance $\frac{1}{20}$ in. for each complete turn.)

expl 5: How many pounds of grease are contained in a barrel if the barrel holds $46 \frac{1}{2}$ gallons?

Each gallon of grease weighs $7 \frac{2}{3}$ lb. Give your answer as a whole number, proper fraction, or
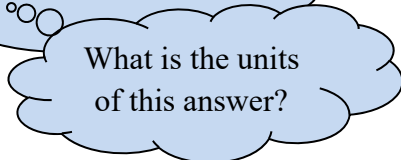
mixed number.

> Unit (dimensional) analysis helps me.

expl 6: A patio $15 \frac{1}{2}$ feet wide is being constructed next to a house. To drain water away from

the house, a slope of $\frac{1}{4}$ inch per foot is needed. What total difference in height is required from

one edge of the patio to the other?

> We need a height difference of $\frac{1}{4}$ inch *for every* foot of width.

> What is the units of this answer?

expl 7: What is the height of 12 courses of $2 \frac{1}{4}$ -in. bricks with $\frac{3}{8}$ -in. mortar joints? (Twelve

courses mean there will be 12 rows of brick and 11 mortar joints.)