Multiplying Fractions, Mixed Numbers, and Rational Expressions

To multiply fractions, _____ across their numerators and denominators.

Ex 1.
Multiply and write the product in lowest terms.
$\frac{5}{9} \cdot \frac{3}{10}$

Ex 2.
Multiply and write the product in lowest terms.

$$-\frac{18}{20} \cdot \frac{30}{32}$$

Ex 3.
Multiply and write the product in lowest terms.

$$\frac{18xy}{5} \cdot \left(-\frac{10x^2}{21y^2}\right)$$

To multiply mixed numbers, convert to _____, multiply, and convert result to mixed number.

Ex 4.
Multiply and write the product as a mixed number in lowest terms.
$3\frac{1}{3} \cdot 1\frac{2}{5}$

Note: We could get an estimate of the product by multiplying the closest whole numbers (in previous example, $3 \cdot 1 = 3$). This is a good sanity check when we get our answer.

Ex 5.

Estimate, then find the product as a mixed number in simplest form.

$5\frac{2}{3} \cdot 2\frac{1}{7}$

Ex 6.

Estimate, then find the product as a mixed number in simplest form.

$2\frac{3}{8} \cdot (-12)$

Ex 7.

Simplify $\left(\frac{2}{5}\right)^3$

In general, $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$ (for $b \neq 0$)

Ex 8.

Simplify $\left(\frac{3x^2}{4z}\right)^3$

"Of"

A fraction **of** a whole number translates to multiplication: "$\frac{3}{4}$ **of** 32 people" becomes $\frac{3}{4} \cdot 32 = 24$

A whole number out **of** a whole number translates to a fraction: "35 out **of** 39 people" becomes $\frac{35}{39}$

Ex 9.

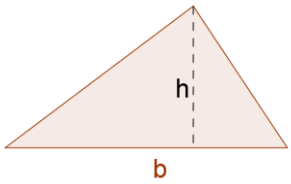
An ad says that 4 out of 5 dentists choose Crest toothpaste. In a room with 345 dentists, how many would you expect to choose Crest's toothpaste?

Ex 10.

A study finds that $\frac{3}{4}$ of Mt. SAC students like Taco Nazo, and $\frac{1}{5}$ of these students don't like fish tacos. What fraction of Mt. SAC students like Taco Nazo but don't like fish tacos?

Area of Triangle

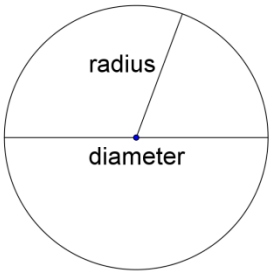
Area of a triangle is given by: $\boldsymbol{A = \frac{1}{2}bh}$ (b is base, and h is height)



Ex 11.

Find the area of a triangle with a base of $7\frac{2}{3}$ meters and a height of $4\frac{4}{5}$ meters.

Circles



The distance from the center to any point on the circle is called the _____.

The distance across a circle through the center is called the _____.

Ex 12.

Find the diameter of a circle with radius $2\frac{3}{5}$ feet.

The distance around a circle is called the _____. It turns out that for any circle the circumference divided by the diameter is the same number (approximately $3.1415926\ldots$), which we call pi, and write π. That is, $\frac{C}{d} = \pi$

Note: π is an _____ (that is, it can't be written as a rational number), but $\frac{22}{7}$ is a pretty good approximation. So, $\pi \approx \frac{22}{7}$.

From this, we get a formula for the circumference of a circle: $\boldsymbol{C = \pi d}$ (or $\boldsymbol{C = 2\pi r}$)

Ex 13.

Find the circumference of the following circle (use $\pi \approx \frac{22}{7}$).