You are about to embark on the most exciting journey of your mathematical life: Precalculus!! To get off on the right foot, (or left foot if you prefer), we have already decided your first assignment AND you have ALL summer to complete it. To access your assignment go to www.lakeseagles.com, click on Academic and go down to Departments and click on Mathematics. There you will find a link to the assignment of your dreams. Please be prepared for the first week of class by having it complete by the Friday of that week. It will be collected on the first Friday of the first school week.

Summer Content to Review from Algebra II to Pre-calculus

This is your first Precalculus assignment. It will be collected, for a grade, the first Friday of the school year. Be sure to show all your work. Enjoy!!

Useful resources:

* Homework Hotline: (312) 645-5555
* www.glencoe.com/sec/math/precalculus/amc_04/index.php/il
* www.math.com
* www.coolmath4kids.com/lessons
* www.math.rice.edu/~lanius/Patterns
* www.algebasics.com

Provide ALL answers in exact value (use radicals) unless rounding is stated in the directions.

1. Polynomial Calculations

a) Multiply: $(3x - 4)^2$

b) Multiply & Simplify: $(2 - \sqrt{3})(\sqrt{3} - \sqrt{12})$

c) Simplify: $\frac{2x^2 + 14x + 24}{x + 4}$

2. Solve the Quadratic Equations for x

a) $2x^2 + x - 15 = 0$

b) $2x^2 - 3x - 20 = 0$

c) $3x^2 + 18x + 27 = 0$

d) $\sqrt{x+3} - 2 = x$

3. Rationalize the Denominators

a) $\sqrt{\frac{2}{5}}$

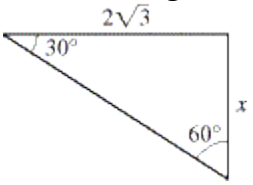
b) $\frac{6}{4-\sqrt{8}}$ (hint: use the conjugate and break down the radical)

4. Special triangles

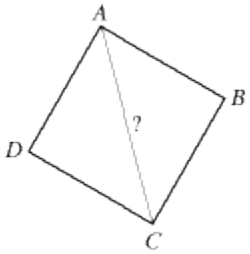
a) If one leg of a right triangle is 8 inches long, and the other leg is 12 inches long, exactly how many inches long is the triangle's hypotenuse?

b) If the angles $\angle X$ and $\angle Y$ each measure between 0° and 90°, and if sin X = cos Y, what is the *sum* of the measures of the angles $\angle X$ and $\angle Y$?

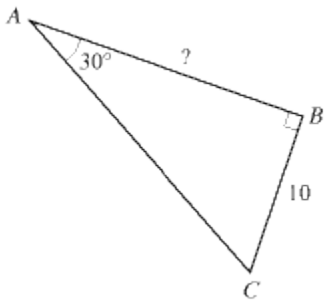
c) Lengths for the triangle below are given in feet. What is the exact value of x?



d) Square *ABCD* below has a perimeter of 28 inches. WITHOUT USING A CALCULATOR, give the exact length of diagonal $\overline{AC}$?



e) In the figure below, ∠B is a right angle and the measure of ∠A is 30°. If $\overline{BC}$ is 10 units long, then what is the exact value of $\overline{AB}$?



5. Law of sines $\frac{sinA}{a} = \frac{sinB}{b} = \frac{sinC}{c}$

Solve the following triangle and round to the nearest thousandths:

B = _____

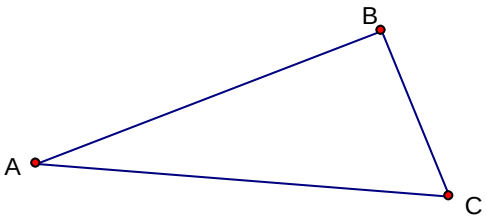
C = _____

AC = _____

m∠BAC = 25.70°

m $\overline{BC}$ = 2.31 cm

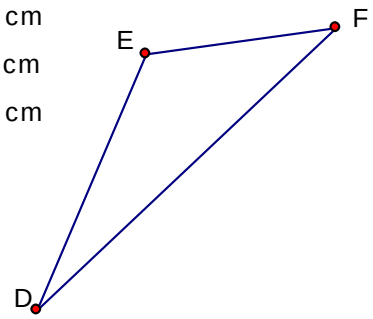
m $\overline{AB}$ = 4.77 cm



6. Law of cosines $c^2 = a^2 + b^2 - 2abcosC$

Solve the following triangles and round to the nearest thousandths.

a) m $\overline{FD}$ = 4.98 cm
m $\overline{EF}$ = 2.32 cm
m $\overline{DE}$ = 3.37 cm

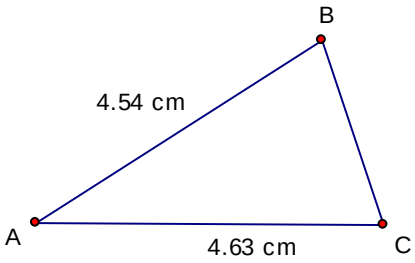


$\angle D$ = _____

$\angle E$ = _____

$\angle F$ = _____

b) $m\angle BAC = 71.42°$



BC = _____

$\angle B$= _____

$\angle A$= _____

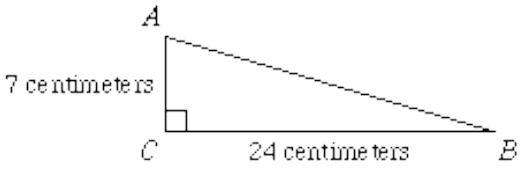
7. Properties of exponents

a) Simplify with positive exponents only: $\left(\frac{4x^2y^{-1}}{6xy}\right)^{-3}\left(\frac{y^4}{x^6y^2}\right)$

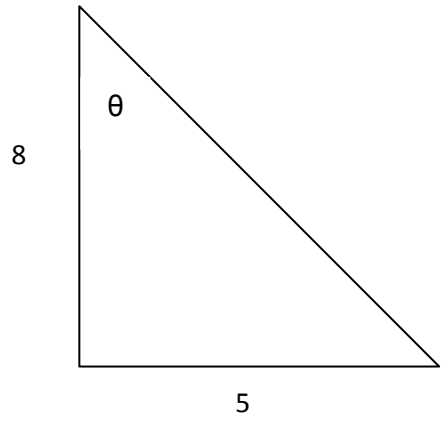
8. Trigonometry

a) In $\triangle ABC$, if $\angle A$ and $\angle B$ are acute angles, and $\sin A = \frac{10}{13}$, what is the exact value of $\cos A$?

b) In right triangle $\triangle ABC$ below, exactly what is the sine of $\angle A$?



c) Find the exact value of the six trigonometric functions for the following triangles (reduce and rationalize the denominator when necessary):



$\sin\theta =$ _____

$\cos\theta =$ _____

$\tan\theta =$ _____

$\csc\theta =$ _____

$\sec\theta =$ _____

$\cot\theta =$ _____

d) Evaluate the exact value of $\sin^{-1}\frac{\sqrt{3}}{2}$ for $90^\circ \leq x < 180^\circ$

e) Evaluate the exact value of $\tan^{-1}(-1)$ for $\frac{3\pi}{2} \leq \theta < 2\pi$

9) Complete the Square by Finding the Value for the ?????

a) $x^2 + 6x + ?????$

b) $x^2 - 8x + ?????$

c) $x^2 - x + ?????$

10) Solve by completing the square – find the exact answers (imaginary values may be in the solution!)

a) $x^2 + 4x = 9$

b) $x^2 - 3x + 4 = 0$

c) $2x^2 + 4x + 8 = 0$