6.2 Law of Sines

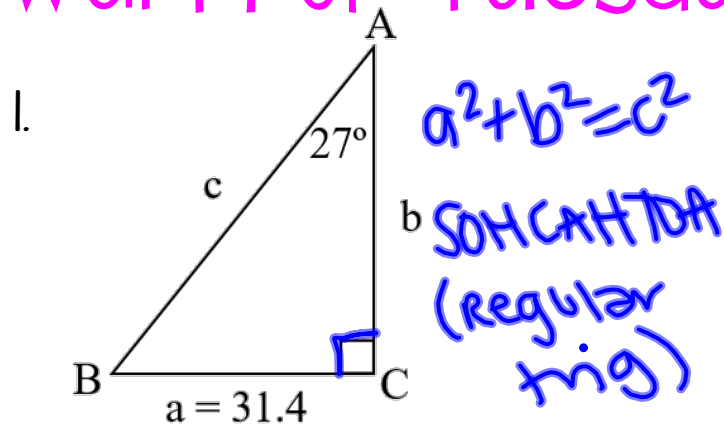## Warm-up Tuesday

1.

$27°$
c
b
B
$a = 31.4$
A
C

$a^2 + b^2 = c^2$
SOHCAHTOA
(Regular trig)

Write HOW you would solve each of the given triangles.

2. $p = 15, q = 19, r = 43$

Law of cosines

3. What does "solving a triangle" even mean??

find all missing sides/ angles

About Me

1. Would you rather be drowned or burned alive?

2. Would you rather be president of the US or king/queen of England?

questions, comments, concerns?

Precalculus Unit 6 Law of Sines and Cosines

6.1 Law of Cosines   Name_____

Solve for the length of the missing side of each triangle. Round your answer to the nearest tenth.

1. $m\angle = 113°$, a = 13, b = 23

2. $m\angle A = 32°$, b = 23, c = 47

Solve each triangle for the specified angle measure. Round your answer to the nearest degree.

3. a = 11, b = 14, c = 17; $m\angle A$

4. a = 17, b = 17, c = 24; $m\angle C$

$$24^2 = 17^2 + 17^2 - 2(17)(17)\cos C$$
$$-17^2 - 17^2 \quad -17^2 \quad -17^2$$
$$\frac{-2}{-578} = \frac{-578\cos C}{-578}$$
$$\cos C = \frac{2}{578}$$
$$C = \cos^{-1}\left(\frac{2}{578}\right)$$
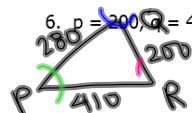$$\boxed{90°}$$

Solve each ΔPQR. Round lengths to the nearest tenth, and angles to the nearest degree.

5. $m\angle P = 83°$, r = 43, q = 51

NORMAL FLOAT AUTO REAL DEGREE MP
$51^2 - 43^2 - 62.6^2$
                    -3166.76
$-2*43*62.6$
                    -5383.6

6. p = 200, q = 410, r = 280

$\angle P = 83°$ P = 200
$\angle Q = 54°$ q = 410
$\angle R = $ 180-83-54   r = 280

$$200^2 = 280^2 + 410^2 - 2(280)(410)\cos P$$

$$410^2 = 280^2 + 200^2 - 2(280)(200)\cos Q$$

6.2 Law of Sines

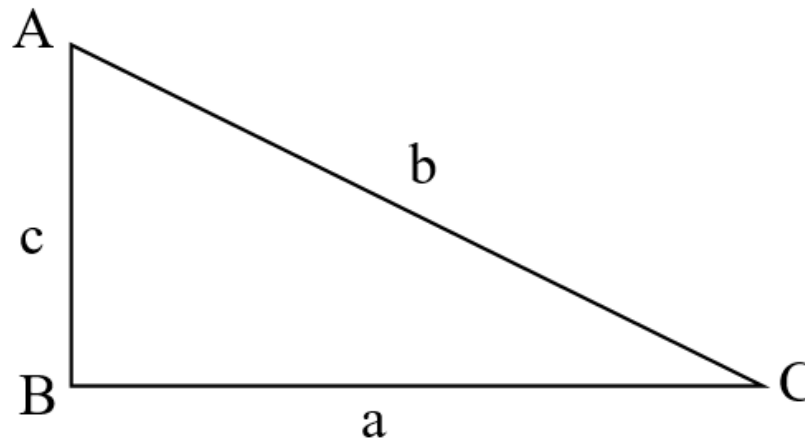**FQ:** How do I use the law of sines to solve oblique triangles?

In $\triangle ABC$

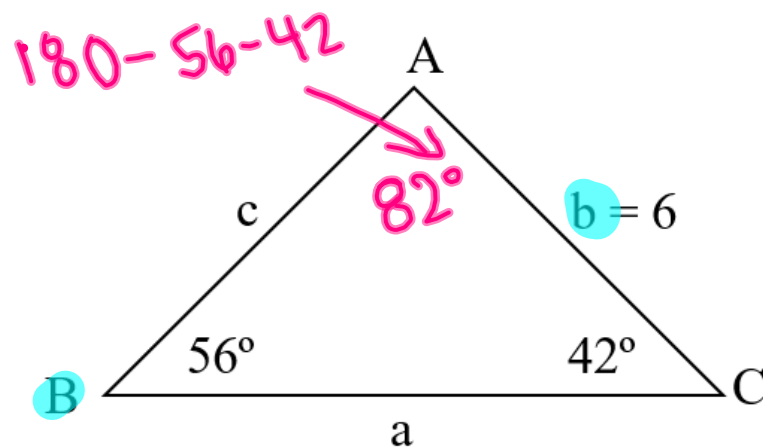$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \qquad \textbf{OR} \qquad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

6.2 Law of Sines

FQ: How do I use the law of sines to solve oblique triangles?

Example 1 - Find a and c.

$180 - 56 - 42$

$82°$

A

c

$b = 6$

B $56°$ $42°$ C

a

$$\frac{\sin 56}{6} = \frac{\sin 82}{a}$$

$$a = \frac{6 \sin 82}{\sin 56} = \boxed{7.2}$$

$$\frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\frac{\sin 56}{6} = \frac{\sin 42}{c}$$

$$\frac{c \sin 56}{\sin 56} = \frac{6 \sin 42}{\sin 56}$$

$$\boxed{c = 4.8}$$

NORMAL FLOAT AUTO REAL DEGREE MP

$24^2 - 17^2 - 17^2$
                                            -2.
$-2*17*17$
                                          -578
$\cos^{-1}(2/578)$
                                  89.80174431
$6\sin(42)/\sin(56)$
                                  4.842704084

6.2 Law of Sines
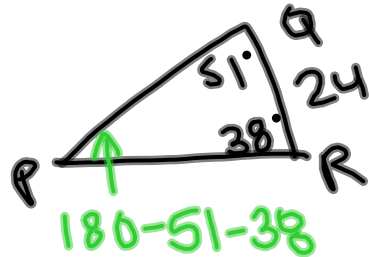
FQ: How do I use the law of sines to solve oblique triangles?

Example 2 – Given: In $\triangle ABC$, $a = 6$, $m\angle B = 60°$, $m\angle C = 42°$. Find b.

6.2 Law of Sines

FQ: How do I use the law of sines to solve oblique triangles?

Solve each triangle PQR. Give angles to the nearest degree and sides to the nearest tenth.

3. $p = 24$, $m\angle Q = 51°$, $m\angle R = 38°$

$\angle P = \underline{91°}$ $p = \underline{24}$

$\angle Q = \underline{51°}$ $q = \underline{18.7}$

$\angle R = \underline{38°}$ $r = \underline{14.8}$

$180 - 51 - 38$

$q: \dfrac{\sin 91}{24} = \dfrac{\sin 51}{q}$

$r: \dfrac{\sin 91}{24} = \dfrac{\sin 38}{r}$

6

PreCalculus Unit 6 2 HW_Law_of_Sines_1.doc & Cosines
6.2 Law of Sines   Name _____

Solve each triangle for the indicated side to the nearest tenth.

1. m∠A = 41°, m∠B = 57°, c = 52; find b

2. m∠A = 35°, m∠B = 56°, a = 51; find c

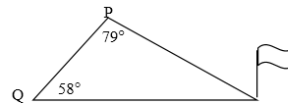Solve each triangle PQR. Give angles to the nearest degree and sides to the nearest tenth.

3. p = 24, m∠Q = 51°, m∠R = 38°

4. q = 48, m∠P = 63°, m∠R = 51°

5. q = 75, m∠P = 42°, m∠R = 20°

Solve the following word problem. Give sides to the nearest tenth.

6. From two points P and Q that are 140 ft apart, the lines of sight to a flagpole across a river make angles of 79° and 58° respectively, with the line joining P and Q. What are the distances from P and Q to the flagpole?

6.2 Law of Sines

FQ: How do I use the law of sines to solve oblique triangles?

~~CLOSING~~

ON CLASSROOM

6.2 Law of Sines

FQ: How do I use the law of sines to solve oblique triangles?

CLOSING

Solve each triangle PQR. Give angles to the nearest degree and sides to the nearest tenth.

10. q = 75, m∠P = 42°, m∠R = 20°