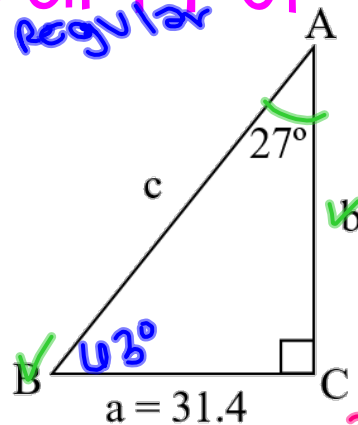


6.2 Law of Sines

~~WARM-UP THURSDAY~~

1. *Regular*



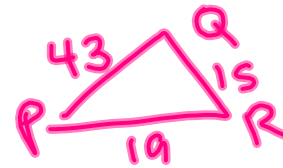
$$\begin{aligned}\tan 27 &= \frac{31.4}{b} \\ \cdot 509 &= \frac{31.4}{b} \\ \cdot 509b &= \frac{31.4}{\cdot 509} \\ b &= 61.6\end{aligned}$$

$$31.4^2 + 61.6^2 = c^2$$

$$c = \boxed{69.1}$$

2. Solve each of the given triangles.

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



Law of cosines

NO solution ☹️

~~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?

6.1 Homework Key

1. 27.5

2. 30.5

3. 30.1

4. 29.4

5. 40°

6. 39°

7. 105°

8. 106°

9. 90°

10. 90°

11. $\angle Q = 63^\circ$
 $\angle P = 87^\circ$
 $r = 9$

12. $\angle Q = 54^\circ$
 $\angle R = 43^\circ$
 $p = 62.6$

13. $\angle R = 42^\circ$
 $\angle P = 25^\circ$
 $q = 59$

14. Does Not Exist

15. $\angle R = 31^\circ$
 $\angle P = 96^\circ$
 $\angle Q = 53^\circ$

16. $\angle Q = 116^\circ$
 $\angle P = 26^\circ$
 $\angle R = 38^\circ$

17. 575 ft.

18. $51.7^\circ, 82^\circ, 46.3^\circ$

questions, comments, concerns?

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. $m\angle C = 115^\circ$, $a = 11$, $b = 21$

2. $m\angle C = 113^\circ$, $a = 13$, $b = 23$

3. $m\angle A = 32^\circ$, $b = 23$, $c = 47$

4. $m\angle A = 34^\circ$, $b = 24$, $c = 46$

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

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

6. $a = 12$, $b = 16$, $c = 19$; $m\angle A$

7. $a = 23$, $b = 43$, $c = 31$; $m\angle B$

8. $a = 21$, $b = 42$, $c = 31$; $m\angle B$

9. $a = 12$, $b = 12$, $c = 17$; $m\angle C$

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

Solve each $\triangle PQR$. Round lengths to the nearest tenth, and angles to the nearest degree.

11. $m\angle R = 30^\circ$, $p = 18$, $q = 16$

12. $m\angle P = 83^\circ$, $r = 43$, $q = 51$

13. $m\angle Q = 113^\circ$, $p = 27$, $r = 43$

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

15. $p = 310$, $q = 250$, $r = 160$

16. $p = 200$, $q = 410$, $r = 280$

Solve the following word problems.

17. A triangular field is 452 ft on one side, and 572 ft on another. The sides meet in an angle of 67.1° . Find the length of the third side to the nearest foot.

18. If a triangular parcel of land has sides of lengths 541 ft, 429 ft, and 395 ft, what are the measures of the angles between the sides, to the nearest tenth of a degree?

6.2 Law of Sines

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

In $\triangle ABC$

uppercase \rightarrow angle
lowercase \rightarrow side

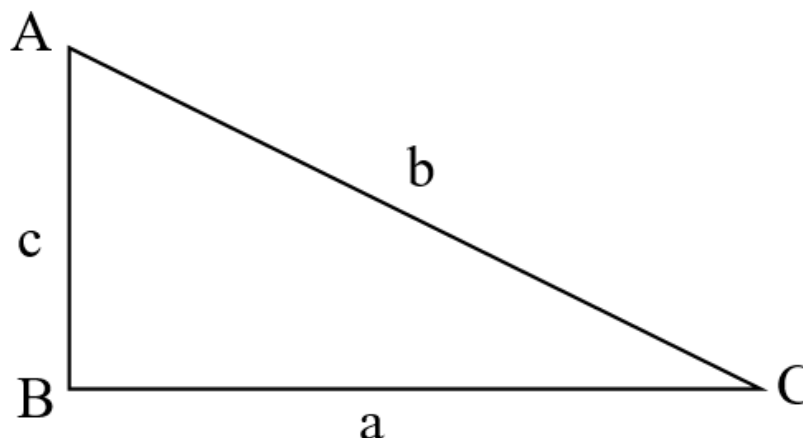
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

OR

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

sines
ASA
AAS
SSA

cosines
SAS
SSS

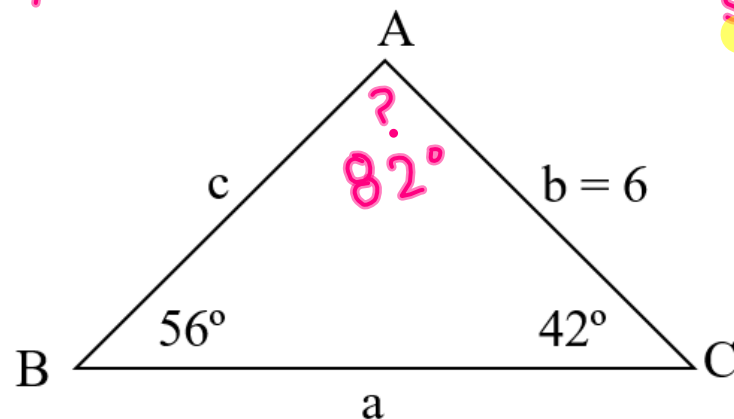


6.2 Law of Sines

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

Example 1 - Find a and c.

$$\angle A = 180 - 56 - 42$$



~~$$\frac{c}{\sin 42} = \frac{b}{\sin 56}$$~~

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

$$c = 4.8$$

~~$$\frac{a}{\sin 82} = \frac{b}{\sin 56}$$~~

$$a = 7.2$$

6.2 Law of Sines

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

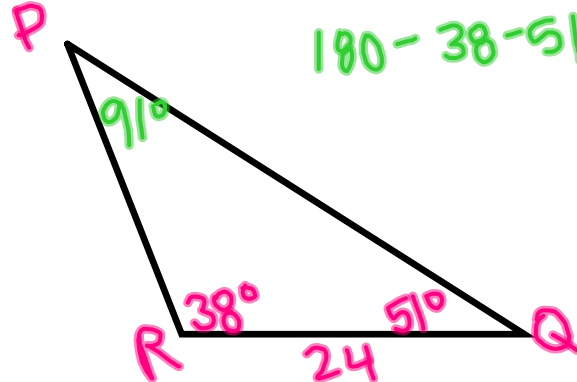
Example 2 - Given: In $\triangle ABC$, $a = 6$, $m\angle B = 60^\circ$, $m\angle C = 42^\circ$. Find b .

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. $p = 24$, $m\angle Q = 51^\circ$, $m\angle R = 38^\circ$



$$\begin{array}{ll} m\angle P = 91^\circ & p = 24 \\ m\angle Q = 51^\circ & q = 18.7 \\ m\angle R = 38^\circ & r = 14.8 \end{array}$$

$$\frac{q}{\sin 51} = \frac{24}{\sin 91}$$

$$\frac{r}{\sin 38} = \frac{24}{\sin 91}$$

NORMAL FLOAT AUTO a+bi DEGREE MP

24*sin(51	4.842704084
Ans/sin(91	18.65150307
24sin(38	18.65434422
Ans/sin(91	14.77587541
	14.77812619

6.2 Law of Sines

ALL

Name _____

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

1. $m\angle A = 39^\circ$, $m\angle B = 42^\circ$, $c = 47$; find a

2. $m\angle A = 41^\circ$, $m\angle B = 57^\circ$, $c = 52$; find b

3. $m\angle B = 72^\circ$, $m\angle C = 31^\circ$, $a = 103$; find b

4. $m\angle B = 34^\circ$, $m\angle C = 71^\circ$, $a = 115$; find b

5. $m\angle A = 48^\circ$, $m\angle B = 38^\circ$, $b = 49$; find c

6. $m\angle A = 35^\circ$, $m\angle B = 56^\circ$, $a = 51$; find c

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

7. $p = 18$, $m\angle Q = 46^\circ$, $m\angle R = 39^\circ$

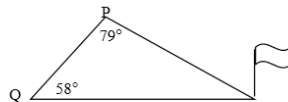
8. $p = 24$, $m\angle Q = 51^\circ$, $m\angle R = 38^\circ$

9. $q = 48$, $m\angle P = 63^\circ$, $m\angle R = 51^\circ$

10. $q = 75$, $m\angle P = 42^\circ$, $m\angle R = 20^\circ$

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

11. 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~~

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

10. $q = 75$, $m\angle P = 42^\circ$, $m\angle R = 20^\circ$