

HW 5-3

GHW#9 Due Next Wed, 12/18

1. $k = \frac{1}{2}ab \sin C$

9. 55.5 Mini Quizzes Today & Fri this week

2. 54 units²

10a. 8

3. 6 units²

10b. 39.8 units²

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

Warm-up with the 2 questions at the top of today's notes.

5. 12

6. 3

7. 5.7

8. 9.5

Dec 5-10:04 PM

HW 5-3

1. $k = \frac{1}{2}ab \sin C$

9. 55.5

2. 54 units²

10a. 8

3. 6 units²

10b. 39.8 units²

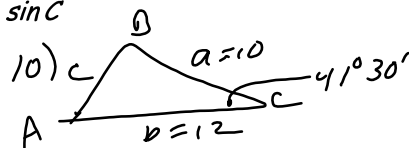
4. $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

5. 12

6. 3

7. 5.7

8. 9.5



$$\begin{aligned} a) \quad c^2 &= 10^2 + 12^2 - 2(10)(12) \cos 41^\circ 30' \\ c^2 &= 64.250 \dots \\ c &= 8.01 \approx 8 \end{aligned}$$

$$\begin{aligned} b) \quad k &= \frac{1}{2}(10)(12) \sin 41^\circ 30' \\ &= 39.8 \text{ units}^2 \end{aligned}$$

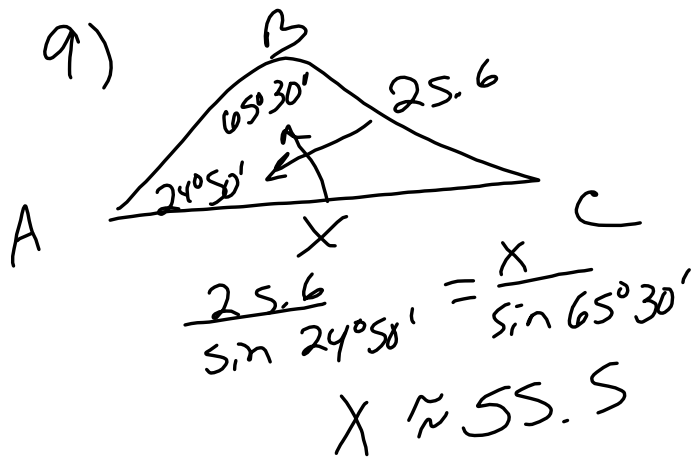


$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{10'}{\sin 90^\circ} = \frac{X}{\sin 72^\circ}$$

$$\begin{aligned} X &= \frac{10 \sin 72^\circ}{\sin 90^\circ} \\ X &\approx 9.5 \text{ feet} \end{aligned}$$

Dec 5-10:04 PM

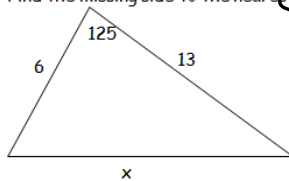


Dec 16-7:44 AM

Law of Sines

Warm-up using the Law of Cosines $c^2 = a^2 + b^2 - 2ab \cos C$

Find the missing side to the nearest tenth using the Law of Cosines.



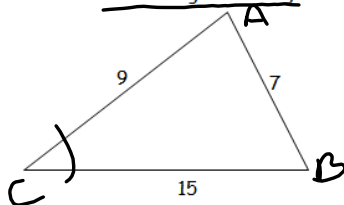
$$x^2 = 6^2 + 13^2 - 2(6)(13) \cos 125^\circ$$

$$x^2 = 294.47$$

$$x = 17.16 \approx 17.2$$

$$17^\circ 51' 7.004''$$

Find the smallest angle of triangle ABC to the nearest minute using the law of cosines.



$$7^2 = 9^2 + 15^2 - 2(9)(15) \cos C$$

$$\cos C = \frac{7^2 - 9^2 - 15^2}{-2(9)(15)} = .95185$$

$$C = \cos^{-1}(.95185) \approx 17^\circ 51'$$

Dec 6-9:54 PM

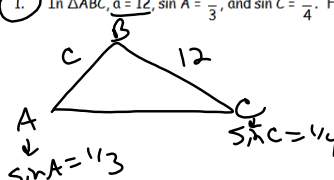
QUIZ

Dec 11-3:50 PM

Using the Law of Sines to find a missing side or angle given AAS or ASA

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

1. In $\triangle ABC$, $a = 12$, $\sin A = \frac{1}{3}$, and $\sin C = \frac{1}{4}$. Find c .



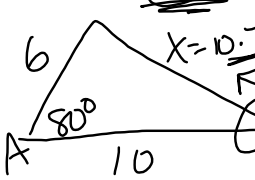
$\sin A = \frac{1}{3}$ $\sin C = \frac{1}{4}$

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

$$\frac{c}{\frac{1}{4}} = \frac{12}{\frac{1}{3}}$$

$$c = \frac{12(\frac{1}{4})}{\frac{1}{3}} = \frac{3}{\frac{1}{3}} = 3 \cdot \frac{3}{1} = 9$$

2. In a triangle, two sides measure 6 cm and 10 cm form an angle that measures 80° . Find, to the nearest degree, the measure of the smallest angle in the triangle.



Find X

$$X^2 = 6^2 + 10^2 - 2(6)(10)\cos 80^\circ$$

$$X^2 = 115.1622$$

$$X = 10.73136612$$

② $\frac{6}{\sin C} = \frac{10.73136612}{\sin 80}$

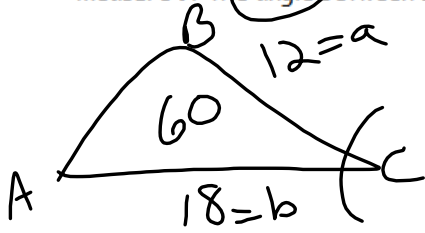
$$\sin C = \frac{6 \sin 80}{10.73136612}$$

$$\sin C = .5506 \dots$$

$$m\angle C = \sin^{-1}(\text{2nd Ans}) = 33.4^\circ \approx 33^\circ$$

Dec 6-9:54 PM

3. Acute triangle ABC has an area of 60 sq. units, with $a = 12$ and $b = 18$. Find the measure of the angle between sides a and b to the nearest degree.



$$K = \frac{1}{2} ab \sin C$$

$$60 = \frac{1}{2} (12)(18) \sin C$$

$$120 = 216 \sin C$$

$$\sin C = \frac{120}{216} \quad \left(= \frac{5}{9} \right)$$

$$m \angle C = \sin^{-1} \left(\frac{5}{9} \right) = 33.7^\circ \approx 34^\circ$$

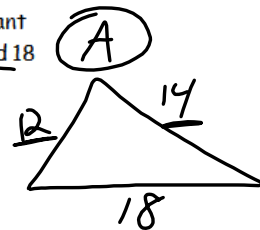
Nov 29-2:06 PM

4. The members of the Horticulture Club are designing a wildflower garden. They want to make it in the shape of a triangle whose sides have lengths 12 feet, 14 feet, and 18 feet.

a. What is the measure of the largest angle in the triangle, to the nearest tenth of a degree?

b. Using your answer to part a, find the area of the triangle to the nearest tenth of a square foot.

c. If one package of wildflower seeds covers 25 square feet, how many packages must they buy?



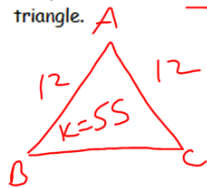
$$\begin{aligned} a) \quad a^2 &= b^2 + c^2 - 2bc \cos A \\ \cos A &= \frac{18^2 - 12^2 - 14^2}{-2(12)(14)} \\ \cos A &= .0476 \\ A &= \cos^{-1} \left(\frac{16}{336} \right) = 87.3^\circ \end{aligned}$$

$$\begin{aligned} b) \quad K &= \frac{1}{2} ab \sin C \\ K &= \frac{1}{2} (12)(14) \sin(87.3^\circ) \\ K &= 83.9 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \frac{83.9}{25} &= \# \text{ pkgs} \\ &= 3.356 \\ &\approx 4 \text{ pkgs} \end{aligned}$$

Nov 29-2:07 PM

Greg wants to build a garden in the shape of an isosceles triangle with one of the congruent sides equal to 12 yards. If the area of the garden will be 55 square yards, find, to the nearest tenth of a degree, the measures of the three acute angles of the triangle.



$$K = \frac{1}{2}bc \sin A$$

$$55 = \frac{1}{2}(12)(12)\sin A$$

$$55 = \frac{1}{2}(144)\sin A$$

$$55 = 72 \sin A$$

$$\sin A = \frac{55}{72} = .7638$$

$$A = \sin^{-1}\left(\frac{55}{72}\right) = 49.8^\circ$$

$\angle B \cong \angle C$ b/c
base & sides of an isosceles $\triangle$
are $\cong$.

$$180 - 49.8 = 130.2$$

$$130.2 \div 2 = 65.1$$

$$B = C = 65.1^\circ$$

$$A = 49.8^\circ$$

Nov 29-2:10 PM

Dec 6-9:58 PM