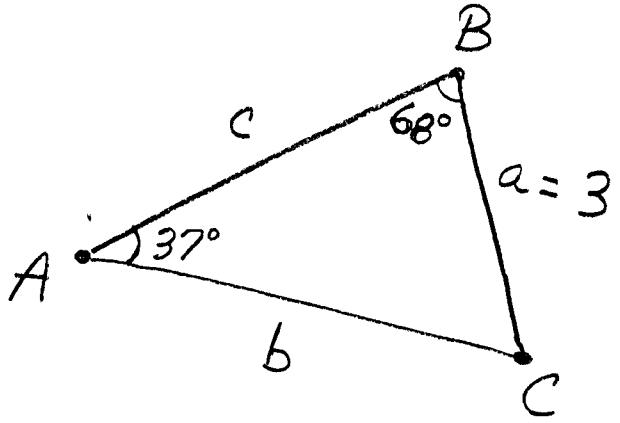
BE - Geometry 1

Monday 12-5-11

① Find b to the nearest tenth



* Note AAS

CAUTION: this is NOT a right △

$m\angle C = ?$

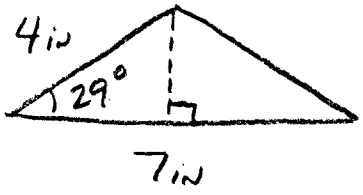
$C = 75°$

Sorry You can't solve this... yet!

Stay tuned.

Homework Review Pg 608 # 62-67

(62)



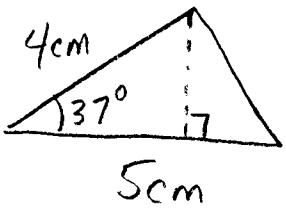
$A = \frac{1}{2}(4)(7)\sin 29°$

$= 14(.4848)$

$= 6.7872$

$A = 6.79\ in^2$ Nearest hundredth

(63)

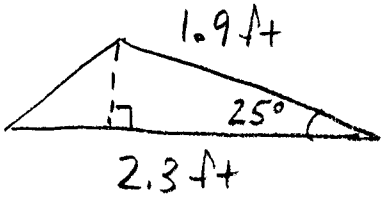


$A = \frac{1}{2}(4)(5)\sin 37°$

$= 10(.6018) = 6.02\ cm^2$

Nearest .01

(64)



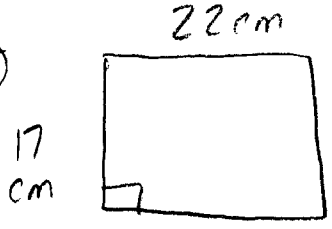
$A = \frac{1}{2}(1.9)(2.3)\sin 25°$

$= (1.9)(1.15)(.4226)$

$= 0.9234$

$A = 0.92\ ft^2$ Nearest .01

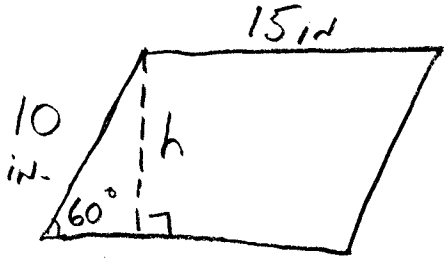
(65)



$A = 17(22)$

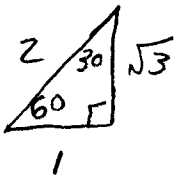
$A = 374\ cm^2$

(66)



$A = bh$

$\sin 60^\circ = \frac{h}{10}$



$10\left(\frac{\sqrt{3}}{2}\right) = h$

$5\sqrt{3} = h$ ∴ $A = 15(5\sqrt{3})$

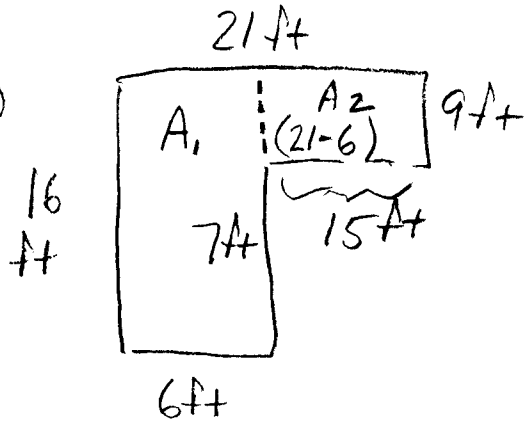
$A = 75\sqrt{3}$

$A = 75(1.7321)$

$A = 129.908$

$A = 129.9 \text{ in}^2$ Nearest tenth

(67)

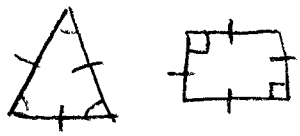


$A_1 = 6 \cdot 16 = 96 \text{ ft}^2$

$A_2 = 15 \cdot 9 = 135 \text{ ft}^2$

TOTAL $A = 231 \text{ ft}^2$

REGULAR POLYGON — A POLYGON IN WHICH ALL the sides AND angles ARE CONGRUENT

(EX) 

EQUILATERAL triangle — SQUARE

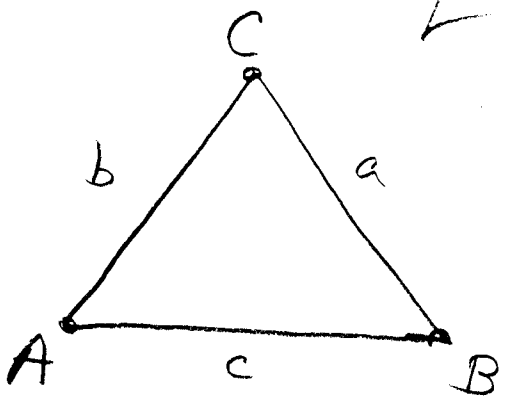
LETS EXTEND THE $A_\Delta = \frac{1}{2}ab\sin C$

$= \frac{1}{2}ac\sin B$

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

to A NEW AND VERY powerful tool.

Recall:



$$A = \frac{1}{2}bc\sin A = \frac{1}{2}ac\sin B = \frac{1}{2}ab\sin C$$

$$\frac{1}{2}bc\sin A = \frac{1}{2}ac\sin B = \frac{1}{2}ab\sin C$$

$\div \frac{1}{2}abc \quad \div \frac{1}{2}abc \quad \div \frac{1}{2}abc$

÷ by $\frac{1}{2}abc$

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

Sin of Angle / opp. side Length

LAW OF SINES

! • USE TO SOLVE ANY △, NOT JUST Right △

! • USE IF YOU KNOW ASA or AAS
(ANY 2 Angles AND 1 SIDE)

Case 1 Pg 380
ignore Case 2

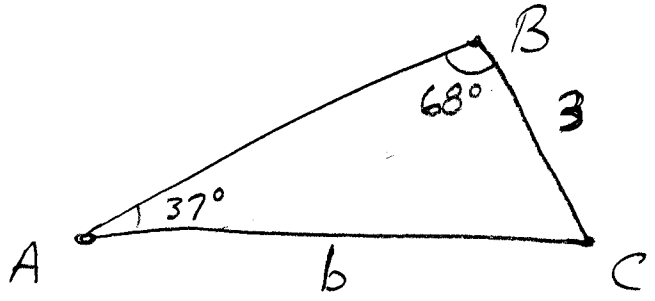
There is A better way!

The EQUATIONS you will use:

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

NOTE:
You can also use $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Ex 1 Pg 378 (A) Find b, nearest .1



$$\frac{\sin 37}{3} = \frac{\sin 68}{b}$$

CAN you go to here USING MENTAL MATH? USING PRODUCTS?

$$b \cdot \frac{\sin 37}{3} = \frac{\sin 68}{b} \cdot b$$

$$\left(\frac{3}{\sin 37}\right) \cdot \frac{b \sin 37}{3} = \sin 68 \left(\frac{3}{\sin 37}\right)$$

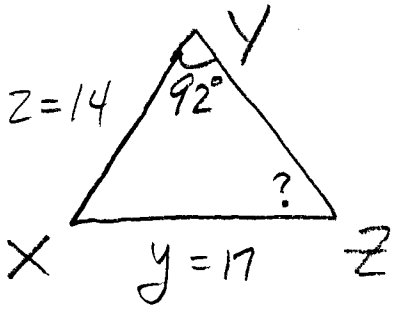
$$b = \sin 68 \cdot \frac{3}{\sin 37}$$

$$b = (.9272) \cdot \frac{3}{(.6018)}$$

$$b = 4.6221$$

$$b \cong 4.6$$

⑥ Find $m\angle Z$ to nearest degree in $\triangle XYZ$ if $y = 17$, $z = 14$ $m\angle Y = 92$



$$\frac{\sin 92}{17} = \frac{\sin Z}{14}$$

$$14 \cdot \frac{\sin 92}{17} = \sin Z$$

$y = 92°$
$y' = 88°$

$$14 \cdot \frac{(\sin 88)}{17} = \sin Z$$

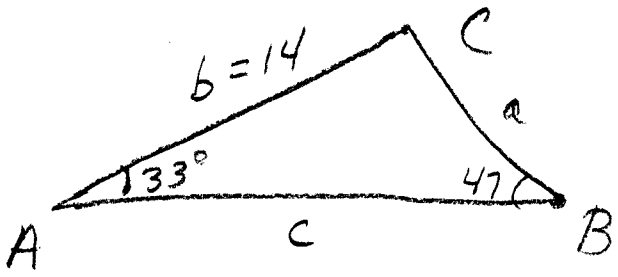
$$.8224 = \frac{14\,(.9986)}{17} = \sin Z$$

$$\therefore \boxed{\sin^{-1}(.8224) = 55°}$$

$\sin 56 = .8290$
$\sin 55 = .8192$

Solving a Triangle — Finding all 3 sides and all 3 angles.

Ex 2 PG 378 (A) SOLVE $\triangle ABC$ if $m\angle A = 33°$, $m\angle B = 47°$, $b = 14$, to nearest .1



$m\angle C \Rightarrow 180 - (47+33) = \boxed{100° = m\angle C}$

$\frac{\sin 47}{14} = \frac{\sin 33}{a}$ $\therefore a \sin 47 = 14 \sin 33$

$a = 14\left(\frac{\sin 33}{\sin 47}\right)$

$a = 14\left(\frac{.5446}{.7314}\right)$

$\boxed{a = 10.424 = 10.4}$

$\frac{\sin 47}{14} = \frac{\sin 100}{C}$ $\therefore C \sin 47 = 14 \sin 100$

$C = 14\left(\frac{\sin 100}{\sin 47}\right)$

$\sin 100 = \sin 80°$

$C = 14\left(\frac{.9848}{.7314}\right)$

$\boxed{C = 18.85 = 18.9}$

Summary:

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

Use for any triangle, will use for $\triangle$'s that are not Right $\triangle$'s if you know two angles and a side ASA, AAS.

Homework: Pg 380 # 5 to 8

Ch. 7-6 The Law of Sines