Ch. 8 Review

Pythagorean Theorem

$a^2+b^2=c^2$

Pythagorean Triple

3,4,5 ~ 5,12,13

Converse For Pythagorean Thrm

If the square of the length of one side of a triangle is (=) to the sum of the squares of the lengths of the other two sides, it's a right triangle

$c^2 \stackrel{?}{=} a^2+b^2$ ~ right △

$c^2 > a^2+b^2$ ~ obtuse △

$c^2 < a^2+b^2$ ~ acute △

*8-1

- **45°-45°-90° Triangle Thrm**

in 45-45-90 △'s, both legs are ≅ and the length of the hypoteneuse is $\sqrt{2}$ x length of leg

hypoteneuse = $\sqrt{2}$ x leg

- **30°-60°-90° Triangle Thrm**

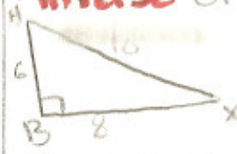
in 30-60-90 △'s, length of the hypoteneuse is 2x the length of the shorter leg. The length of the longer leg is $\sqrt{3}$ x shorter leg

hypoteneuse = 2x shorter leg

longer leg = $\sqrt{3}$ x shorter leg

*8-2

- **inverse of tangent**



$\tan X = \frac{6}{8} = 0.75$ find tan

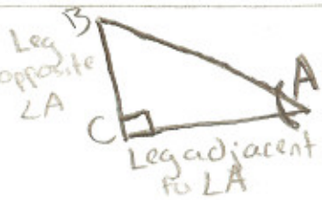
$m\angle X = \tan^{-1}(0.75)$ use inverse tan

TAN^{-1} 0.75 enter 36.86... ↩ use a calculator

*8-3 (cont'd)

- **sine of ∠A =**

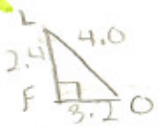
$\frac{\text{leg opposite } \angle A}{\text{hypoteneuse}}$



- **cosine of ∠A =**

$\frac{\text{leg adjacent to } \angle A}{\text{leg opposite } \angle A}$

- using inverses



cos	sin
$\cos L = \frac{2.4}{4.0}$	$\sin L = \frac{3.2}{4.0}$
$m\angle L = \cos^{-1}\left(\frac{2.4}{4.0}\right)$	$m\angle L = \sin^{-1}\left(\frac{3.2}{4.0}\right)$
$\cos^{-1}$ 2.4 ÷ 4.0 (53.13...)	$\sin^{-1}$ 3.2 ÷ 4.0 (53.13...)

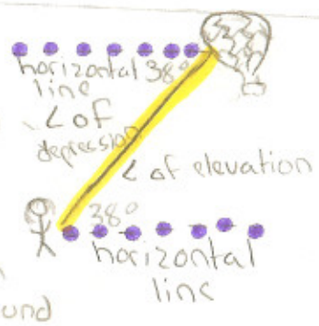
*8-4

- **angle of elevation**

angle from person on ground who sees person in balloon

- **angle of depression**

angle from the person in the hot air balloon who sees person on ground



*8-5

- tangent

tangent of ∠A =

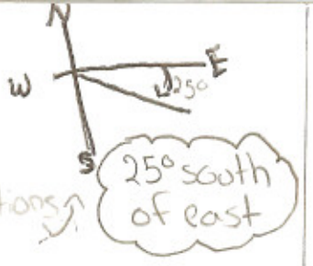
$\frac{\text{length of leg opposite } \angle A}{\text{length of leg adjacent to } \angle A}$

*8-3

- **vector**: any quantity with magnitude and direction
- **magnitude**: (size) corresponds to the distance from the **initial point** to the **terminal point**
- direction corresponds to ~~direction of the arrows~~
- **in coordinate plane**, magnitude and direction of the vector corresponds to direction in which the arrow points

*8-6

- use sine and cosine when describing vectors in order to find x and y
- use compass directions to describe vectors' directions



25° south of east

Adding Vectors:

For $\vec{a} = \langle x_1, y_1 \rangle$ and

$\vec{c} = \langle x_2, y_2 \rangle$, $\vec{a} + \vec{c} = \langle x_1 + x_2, y_1 + y_2 \rangle$

*8-6 (continued)

Oscar **H**ad ~ Sine

A/**H**eap ~ Cosine

Of **A**pples ~ Tangent