① $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

use for SSA, AAS, or ASA
to find missing sides or angles

② $c^2 = a^2 + b^2 - 2(a)(b)\cos C$ use for SAS to find missing side

$C = \cos^{-1}\left(\frac{c^2 - a^2 - b^2}{-2ab}\right)$ use for SSS to find missing angle

③ $K = \frac{1}{2}bh$ when given base and height

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

$K = \sqrt{s(s-a)(s-b)(s-c)}$ when given SSS

④ ⓐ SAS → Law of Cosines

ⓑ AAS, ASA → Law of Sines

ⓒ SSA → Law of Sines

ⓓ SSS → Law of Cosines

⑤ ⓐ SSS → Heron's formula

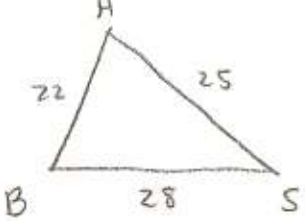
ⓑ SAS → $K = \frac{1}{2}ab\sin C$

ⓒ B, H → $K = \frac{1}{2}bh$

⑥ $28^2 = 22^2 + 25^2 - 2(22)(25)\sin H$

$28^2 = 22^2 + 25^2 - 2(22)(25)\cos H$

False



⑦ $\frac{\sin B}{25} = \frac{\sin H}{22}$

$\frac{\sin B}{25} = \frac{\sin H}{28}$

False

⑧ $S = \cos^{-1}\left(\frac{22^2 - 25^2 - 28^2}{-2(25)(28)}\right)$

$S = \cos^{-1}\left(\frac{22^2 - 25^2 - 28^2}{-2(25)(28)}\right)$

True

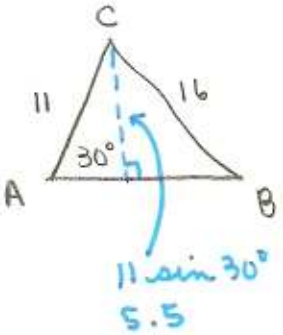
⑨ $\sin H = \frac{28\sin S}{22}$

$\frac{\sin H}{28} = \frac{\sin S}{22}$

$\sin H = \frac{28\sin S}{22}$

True

⑩

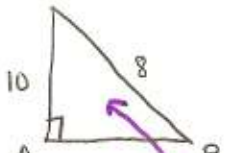


$11\sin 30°$

5.5

1 △

⑪



0 △

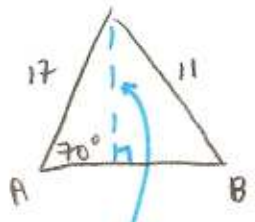
$8 < 10$

⑫

1 △

longest side opp. largest ∠

(13)

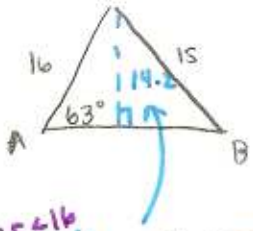


$11 < h$ $\quad 17 \sin 70°$

15.97

0 △

(14)

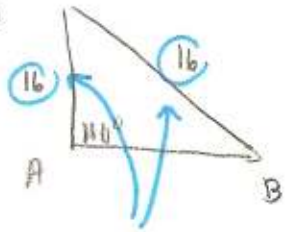


$14.2 < 15 < 16$ $\quad 16 \sin 63°$

14.26

2 △s

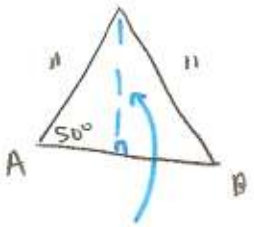
(15)



can't have isosceles △ w/ a base ∠ of 110°

0 △

(16)

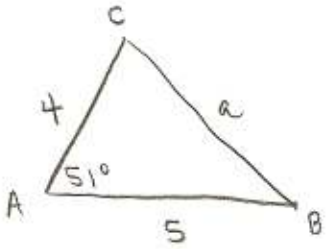


$11 \sin 50°$

$h = 8.4$

1 △

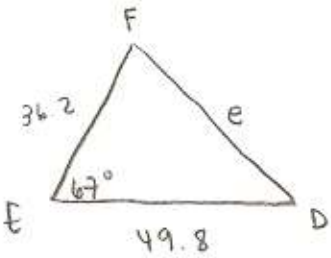
(17)



$\sqrt{a^2} = \sqrt{4^2 + 5^2 - 2(4)(5)\cos 51°}$

$a \approx 3.98$

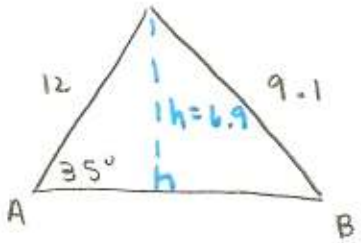
(18)

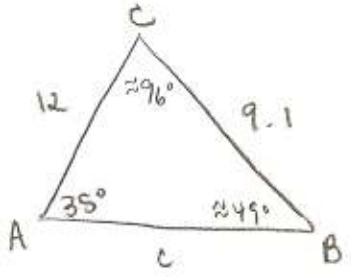


$\sqrt{e^2} = \sqrt{36.2^2 + 49.8^2 - 2(36.2)(49.8)\cos 67°}$

$e \approx 48.80$

(9)





$$\frac{\sin B}{12} = \frac{\sin 35°}{9.1}$$

$$B = \sin^{-1}\left(\frac{12 \sin 35°}{9.1}\right)$$

$\boxed{B \approx 49°}$ STORE!

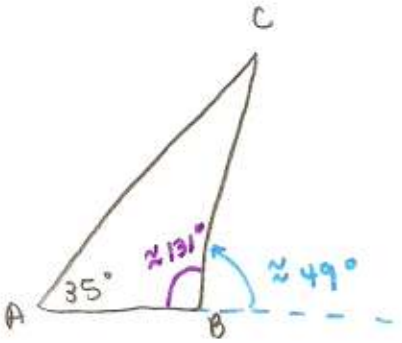
$$C = 180° - 35° - B$$

$\boxed{C \approx 96°}$

$$\frac{\sin C}{c} = \frac{\sin 35°}{9.1}$$

$$c = \frac{9.1 \sin C}{\sin 35°}$$

$\boxed{c \approx 15.8}$



$\boxed{B \approx 131°}$ STORE!

$$C = 180° - 35° - B$$

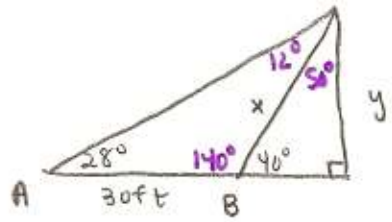
$\boxed{C \approx 14°}$

$$\frac{\sin C}{c} = \frac{\sin 35°}{9.1}$$

$$C = \frac{9.1 \sin C}{\sin 35°}$$

$\boxed{C \approx 3.9}$

(20)



$$\frac{\sin 28^\circ}{x} = \frac{\sin 12^\circ}{30}$$

$$x = \frac{30 \sin 28^\circ}{\sin 12^\circ}$$

$x \approx 67.7$

Store!

$\boxed{67.7 \text{ ft}}$

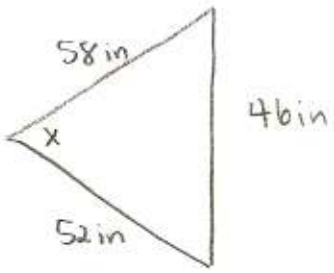
$$\sin 40^\circ = \frac{y}{x}$$

$$y = x \sin 40^\circ$$

$y = 43.5$

$\boxed{43.5 \text{ ft}}$

(21)



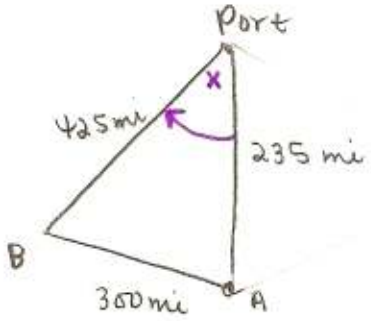
$$46^2 = 52^2 + 58^2 - 2(52)(58)\cos x$$

$$x = \cos^{-1}\left(\frac{46^2 - 52^2 - 58^2}{-2 \cdot 52 \cdot 58}\right)$$

$x \approx 49$

$\boxed{\approx 49^\circ}$

(22)



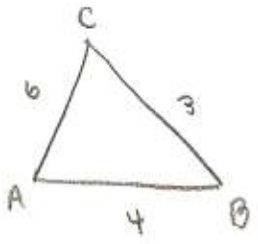
$$300^2 = 425^2 + 235^2 - 2(425)(235)\cos x$$

$$x = \cos^{-1}\left(\frac{300^2 - 425^2 - 235^2}{-2(425)(235)}\right)$$

$x \approx 43.1$

$\boxed{S\ 43.1^\circ\ W}$

(23)



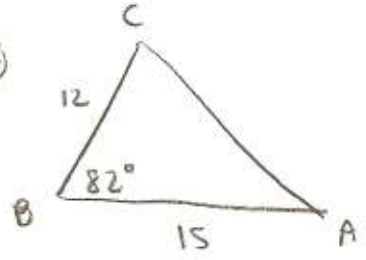
$s = \frac{6+3+4}{2}$

$s = 6.5$

$K = \sqrt{6.5(6.5-6)(6.5-4)(6.5-3)}$

$K \approx 5.3 \text{ in}^2$

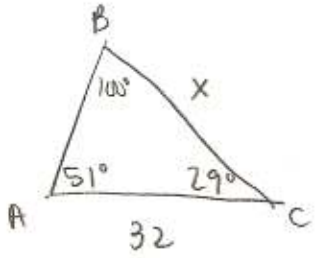
(24)



$K = \frac{1}{2}(12)(15)\sin 82°$

$K \approx 89.1 \text{ in}^2$

(25)



$\frac{\sin 51°}{x} = \frac{\sin 100°}{32}$

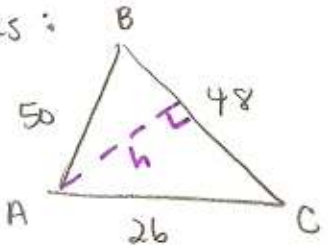
$x = \frac{32 \sin 51°}{\sin 100°}$

$x \approx 25.3$ STORE

$K = \frac{1}{2}(32)(x)\sin 29°$

$K \approx 195.9 \text{ in}^2$

Bonus:



$K = \sqrt{62(62-50)(62-26)(62-48)}$

$K = \sqrt{374976}$

$K \approx 612.35$ store!

$K = \frac{1}{2}bh$

$K = \frac{1}{2}(48)h$

$K = 24h$

$h = \frac{K}{24}$

$h \approx 25.5"$