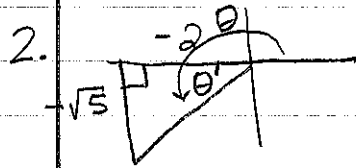
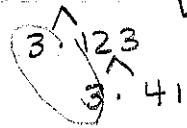


$$r = \sqrt{12^2 + (-15)^2} = \sqrt{144 + 225} = \sqrt{369} = \boxed{3\sqrt{41}}$$

$$\tan \theta' = \frac{-12}{15}$$

$$\theta' = \tan^{-1}\left(\frac{-12}{15}\right)$$

$$\theta' = -38.7 = 38.7^\circ \quad \theta = 180 - 38.7 = \boxed{141.3^\circ}$$

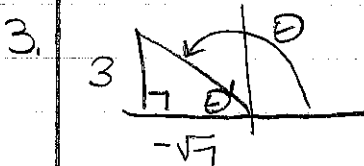


$$r = \sqrt{(-2)^2 + (-\sqrt{5})^2} = \sqrt{4 + 5} = \sqrt{9} = \boxed{3}$$

$$\tan \theta' = \frac{\sqrt{5}}{2}$$

$$\theta' = \tan^{-1}\left(\frac{\sqrt{5}}{2}\right)$$

$$\theta' = 48.2^\circ \quad \theta = 180 + 48.2 = \boxed{228.2^\circ}$$

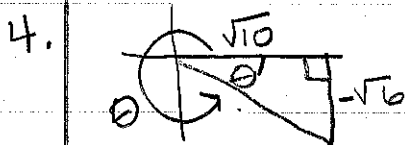


$$r = \sqrt{3^2 + (-\sqrt{7})^2} = \sqrt{9 + 7} = \sqrt{16} = \boxed{4}$$

$$\tan \theta' = \frac{3}{-\sqrt{7}}$$

$$\theta' = \tan^{-1}\left(\frac{3}{-\sqrt{7}}\right)$$

$$\theta' = -48.6 = 48.6^\circ \quad \theta = 180 - 48.6 = \boxed{131.4^\circ}$$



$$r = \sqrt{(\sqrt{10})^2 + (-\sqrt{6})^2} = \sqrt{10 + 6} = \sqrt{16} = 4$$

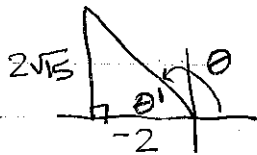
$$\tan \theta' = \frac{-\sqrt{6}}{\sqrt{10}}$$

$$\theta' = \tan^{-1}\left(\frac{-\sqrt{6}}{\sqrt{10}}\right)$$

$$\theta' = -37.8 = 37.8^\circ$$

$$\theta = 360 - 37.8 = \boxed{322.2^\circ}$$

5.



$$r = \sqrt{(-2)^2 + (2\sqrt{15})^2} = \sqrt{4 + 60} = \sqrt{64} = \boxed{8}$$

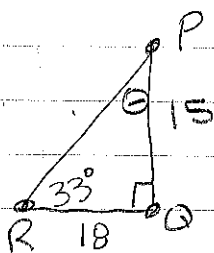
$$\tan \theta' = \frac{2\sqrt{15}}{-2}$$

$$\tan \theta' = -\sqrt{15}$$

$$\theta' = \tan^{-1}(-\sqrt{15})$$

$$\theta' = -75.5 = 75.5 \quad \theta = 180 - 75.5 = \boxed{104.5^\circ}$$

6.

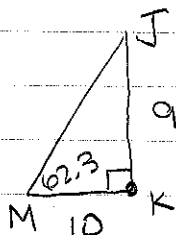


$$r = \sqrt{18^2 + 15^2} = \sqrt{324 + 225} = \sqrt{549} = \boxed{3\sqrt{61}}$$

$$\theta = 90 - 33 = \boxed{57^\circ}$$

$$\begin{array}{r} 3 \sqrt{183} \\ 3 \sqrt{61} \end{array}$$

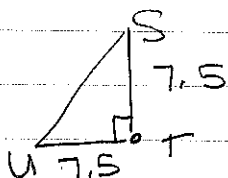
7.



$$r = \sqrt{9^2 + 10^2} = \sqrt{81 + 100} = \sqrt{181}$$

$$\theta = 90 - 62.3^\circ = \boxed{27.7^\circ}$$

8.

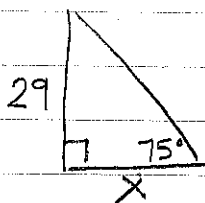


$$r = \sqrt{7.5^2 + 7.5^2} = \sqrt{56.25 + 56.25} = \sqrt{112.5}$$

$$\text{angles} = \boxed{45^\circ}$$

$$\approx \boxed{10.6}$$

9.



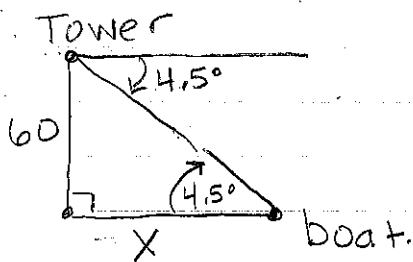
$$\tan 75^\circ = \frac{29}{x}$$

$$x \tan 75^\circ = 29$$

$$\frac{x \tan 75^\circ}{\tan 75^\circ} = \frac{29}{\tan 75^\circ}$$

$$x = \boxed{7.8 \text{ ft}}$$

10.

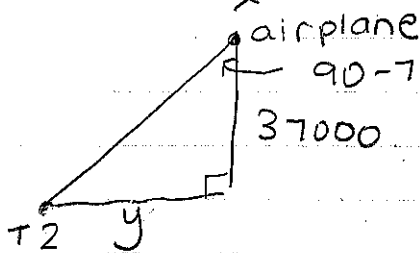
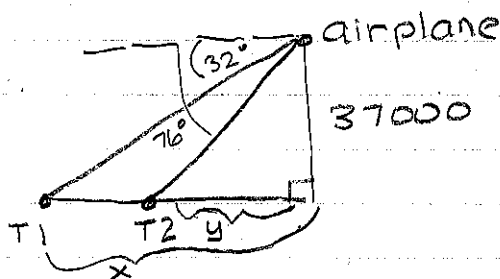


$$\tan 4.5^\circ = \frac{60}{X}$$

$$\frac{X \tan 4.5^\circ}{\tan 4.5^\circ} = \frac{60}{\tan 4.5^\circ}$$

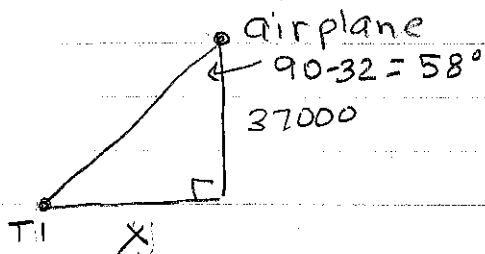
$$\boxed{X = 762.4 \text{ ft}}$$

11.



$$90 - 76 = 14^\circ \quad (37000) \tan 14^\circ = \frac{y}{37000} \quad (37000)$$

$$9225.1 = y$$



$$(37000) \tan 58^\circ = \frac{X}{37000} \quad (37000)$$

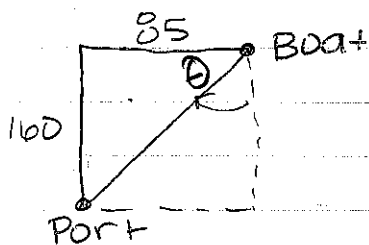
$$59212.4 = X$$

$$X - y = \text{distance between } T1 \text{ \& } T2$$

$$59212.4 - 9225.1$$

$$\boxed{49987.3 \text{ ft}}$$

12.



$$\tan \theta = \frac{160}{85}$$

$$\theta = \tan^{-1} \left( \frac{160}{85} \right)$$

$$\theta = 62.0^\circ$$

$$\boxed{W 62^\circ S} \text{ or } 90 - 62 = 28$$

this one is more proper →

$$\boxed{S 28^\circ W}$$

$$13. a^2 = b^2 + c^2 - 2bc \cos A$$

$$15^2 = 18^2 + 20^2 - 2(18)(20) \cos A$$

$$\begin{array}{r} -18^2 \quad -18^2 \quad +20^2 \\ -20^2 \end{array}$$

$$-499 = -720 \cos A$$

$$\frac{499}{720} = \cos A$$

$$A = \cos^{-1} \left( \frac{499}{720} \right)$$

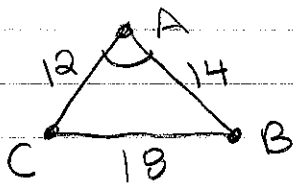
$$\boxed{A = 46.1^\circ}$$

$$14. a^2 = b^2 + c^2 - 2bc \cos A$$

$$a = \sqrt{40^2 + 45^2 - 2(40)(45) \cos 51^\circ}$$

$$a = \boxed{36.9}$$

15.



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$18^2 = 12^2 + 14^2 - 2(12)(14) \cos A$$

$$\begin{array}{r} -12^2 \quad -12^2 \quad +14^2 \\ -14^2 \end{array}$$

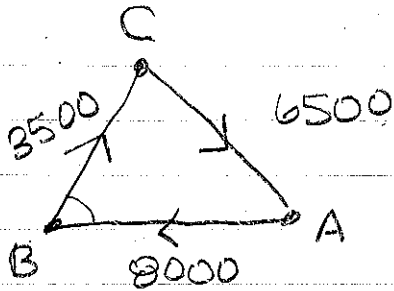
$$-16 = -336 \cos A$$

$$\frac{16}{336} = \cos A$$

$$A = \cos^{-1} \left( \frac{16}{336} \right)$$

$$A = \boxed{87.3^\circ}$$

16.



$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$6500^2 = 3500^2 + 8000^2 - 2(3500)(8000) \cos B$$

$$-3500^2 \quad -3500^2 \quad -8000^2$$

$$-8000^2$$

$$-34000000 = -56000000 \cos B$$

$$\frac{34}{56} = \cos B$$

$$B = \cos^{-1}\left(\frac{34}{56}\right)$$

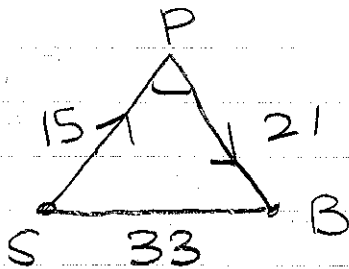
$$B = 52.6^\circ$$

$$E 52.6^\circ N$$

$$\text{or}$$

$$90 - 52.6 = \boxed{N 37.4^\circ E} \text{ "B to C"}$$

17.



$$p^2 = s^2 + b^2 - 2sb \cos P$$

$$33^2 = 21^2 + 15^2 - 2(21)(15) \cos P$$

$$-21^2 \quad -21^2 \quad -15^2$$

$$-15^2$$

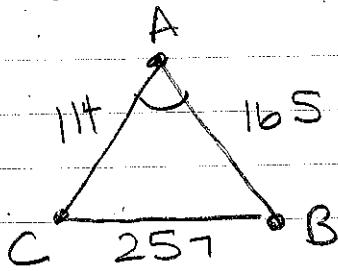
$$423 = -630 \cos P$$

$$-\frac{423}{630} = \cos P$$

$$P = \cos^{-1}\left(\frac{-423}{630}\right)$$

$$P = \boxed{132.2^\circ}$$

18.



$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$257^2 = 114^2 + 165^2 - 2(114)(165) \cos A$$

$$\begin{array}{r} -114^2 \quad -165^2 \\ -165^2 \end{array}$$

$$25828 = -37620 \cos A$$

$$-25828 = \cos A$$

$$\frac{37620}{37620}$$

$$A = \cos^{-1} \left( -\frac{25828}{37620} \right)$$

$$A = \boxed{133.4^\circ}$$