

8.2 Law of Cosines

$$5. \quad \cos A = \frac{12^2 + 16^2 - 10^2}{2(12)(16)}$$

$$A = \cos^{-1} \left( \frac{12^2 + 16^2 - 10^2}{2(12)(16)} \right)$$

A = 38.625°

$$\cos B = \frac{10^2 + 16^2 - 12^2}{2(10)(16)}$$

B = 48.509°

$$38.625^\circ + 48.509^\circ + C = 180$$

C = 92.866°

$$9. \quad \cos A = \frac{15^2 + 21^2 - 11^2}{2(15)(21)}$$

A = 30.108°

$$\cos B = \frac{11^2 + 21^2 - 15^2}{2(11)(21)}$$

B = 43.161°

$$30.108^\circ + 43.161^\circ + C = 180$$

C = 106.731°

$$13. \quad a^2 = 6^2 + 7^2 - 2(6)(7)\cos 120$$

a = 11.269

$$\cos B = \frac{7^2 + 127 - 6^2}{2(7)(11.269)}$$

B = 27.453°

or 27.460°

Rounding:  
a<sup>2</sup> = 127

$$120^\circ + 27.453^\circ + C = 180$$

C = 32.547° or 32.54°

$$17. \quad b^2 = 37^2 + 37^2 - 2(37)(37)\cos(125\frac{2}{3})^\circ$$

b = 65.836

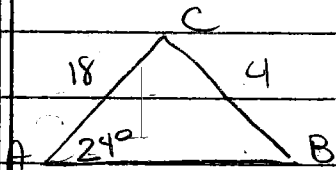
$$\cos A = \frac{65.836^2 + 37^2 - 37^2}{2(65.836)(37)}$$

A = 27.166°

$$125\frac{2}{3}^\circ + 27.166^\circ + C = 180$$

C = 27.167°

29.

SSA  $\rightarrow$  LA is acute  $\rightarrow a < b$ 

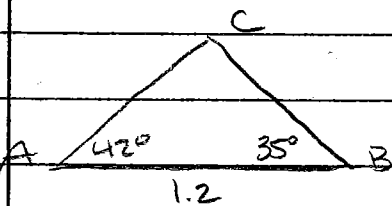
$$18 \sin 24 = 7.3$$

$$a < b \sin A$$

NO solution

SSA  $\rightarrow$  law of Sines

31.



$$42 + 35 + C = 180$$

$C = 103^\circ$

ASA  $\rightarrow$  law of Sines

$$\frac{1.2}{\sin 103} = \frac{a}{\sin 42}$$

$$12 \sin 42 = a \sin 103$$

$$\frac{12 \sin 42}{\sin 103} = \frac{a \sin 103}{\sin 103}$$

$a = .824$

$$\frac{1.2}{\sin 103} = \frac{b}{\sin 35}$$

$$\sin 103 \sin 35 = 12 \sin 35$$

$$b \sin 103 = 12 \sin 35$$

$$\frac{b \sin 103}{\sin 103} = \frac{12 \sin 35}{\sin 103}$$

$b = .706$

33.

$$s = \frac{8 + 12 + 17}{2}$$

$$= 18.5$$

$$A = \sqrt{18.5(18.5-8)(18.5-12)(18.5-17)}$$

$A = 43.519 \text{ u}^2$

35

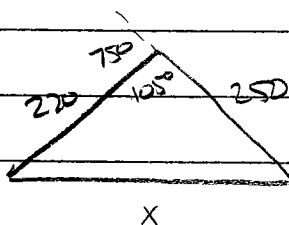
$$s = \frac{2.5 + 10.2 + 9}{2}$$

$$= 10.85$$

$$A = \sqrt{10.85(10.85-2.5)(10.85-10.2)(10.85-9)}$$

$A = 10.438 \text{ u}^2$

43

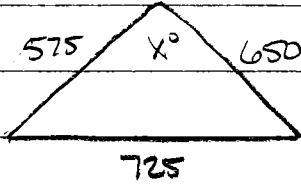


$$x^2 = 270^2 + 250^2 - 2(270)(250) \cos 105$$

$x = 373.323 \text{ m}$

8.2 cont'd

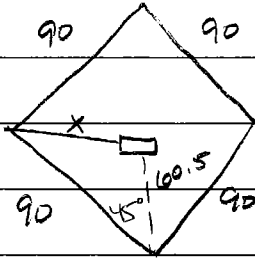
45.



$$\cos X^\circ = \frac{575^2 + 650^2 - 725^2}{2(575)(650)}$$

$$X = 72.281^\circ$$

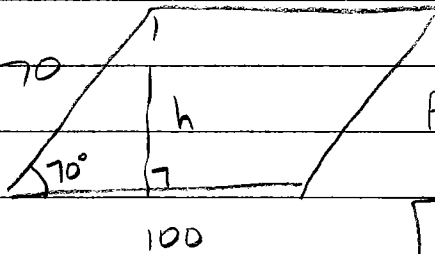
51.



$$X^2 = 90^2 + 60.5^2 - 2(90)(60.5)\cos 45$$

$$= 63.717^\circ$$

60.



$$A = bh$$

$$= 100(65.778)$$

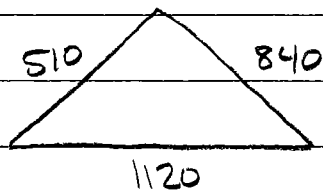
$$6577.848 \text{ m}^2$$

$$\sin 70 = \frac{h}{70}$$

$$70 \sin 70 = h$$

$$65.778 = h$$

61.



$$s = \frac{510 + 840 + 1120}{2}$$

$$= 1235$$

\$2000/acre

$$1 \text{ acre} = 4840 \text{ yds}^2$$

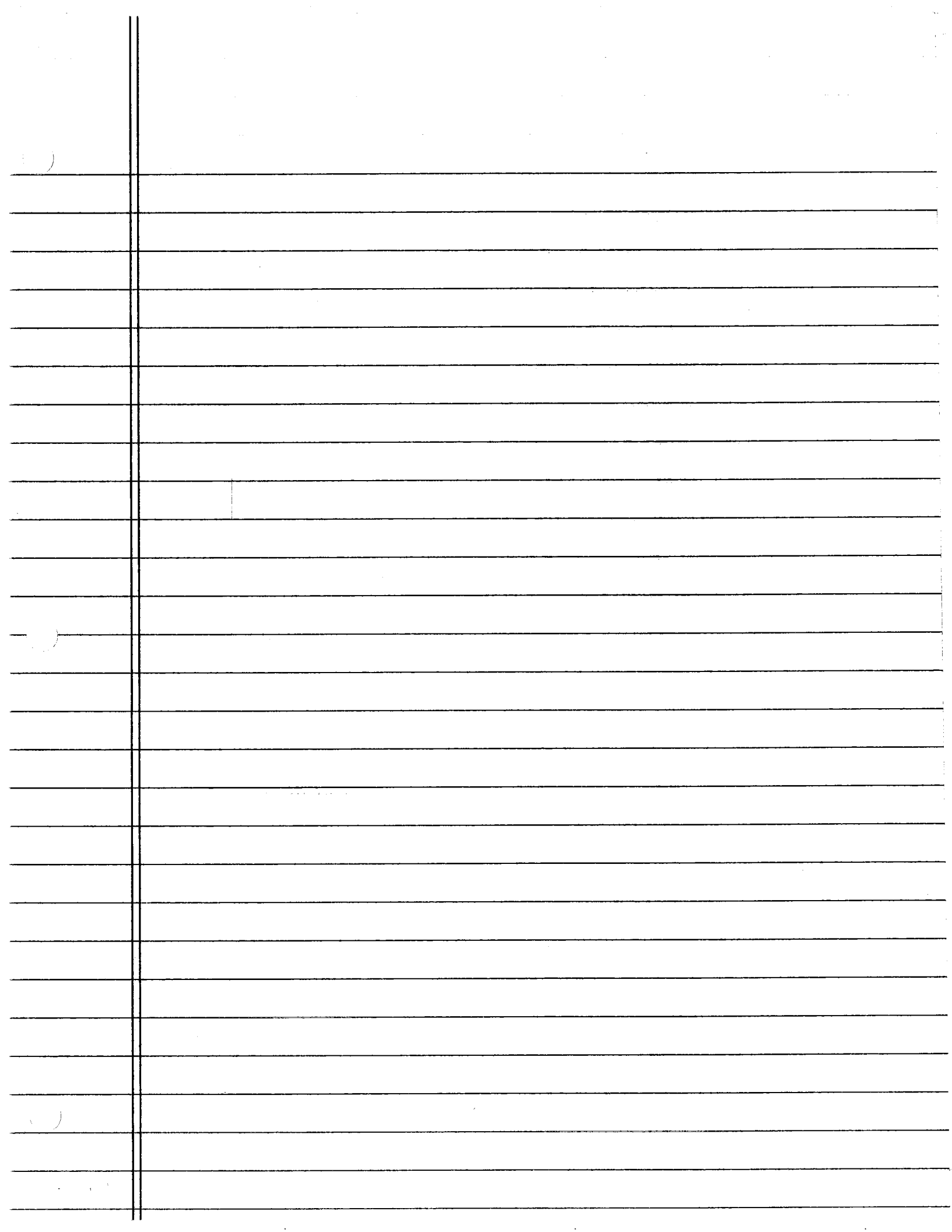
$$A = \sqrt{1235(1235-510)(1235-840)(1235-1120)}$$

$$= 201674.0176 \text{ yd}^2$$

$$\frac{201674.0176}{4840} = 41.668 \text{ acres}$$

$$41.668(2000)$$

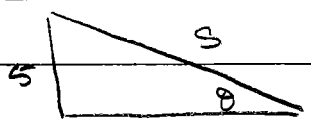
$$= 83,336.37$$



W/6.2

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105.



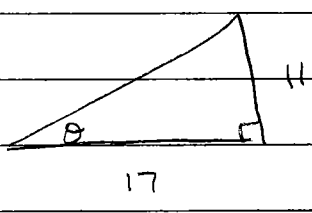
$$\sin \theta = \frac{5}{s}$$

$$a) \theta = \sin^{-1} \left( \frac{5}{s} \right)$$

$$b) s = 40 \quad \theta = 7.181^\circ$$

$$s = 20 \quad \theta = 14.478^\circ$$

108.

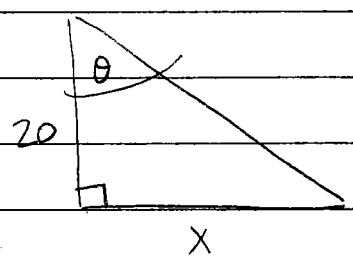


$$a) \tan \theta = \frac{11}{17}$$

$$\theta = \tan^{-1} \left( \frac{11}{17} \right)$$

$$\theta = 32.905^\circ$$

111.



$$a) \tan \theta = \frac{x}{20}$$

$$\theta = \tan^{-1} \left( \frac{x}{20} \right)$$

$$b) x = 5 \quad \theta = 14.036^\circ$$

$$x = 12 \quad \theta = 30.964^\circ$$

