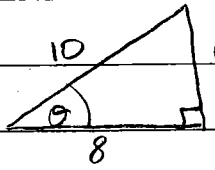
Questions: 45

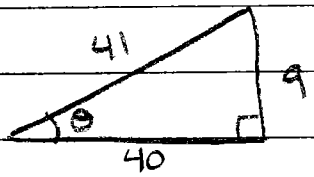
6.2 Homework

Pg. 463 · 1-5, 11-35 EOO
37-45 odd 47-59 EOO
61-67 odd, 70

1. a) v b) iv c) vi d) iii e) i f) ii
2. opposite, adjacent, hypotenuse
3. complementary
4. elevation, depression
5. 

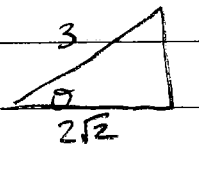
$6^2+8^2=c^2$
$36+64=c^2$
$100=c^2$
$10=c$

$\sin\theta=\frac{3}{4}$	$\csc\theta=\frac{4}{3}$
$\cos\theta=\frac{4}{5}$	$\sec\theta=\frac{5}{4}$
$\tan\theta=\frac{3}{4}$	$\cot\theta=\frac{4}{3}$

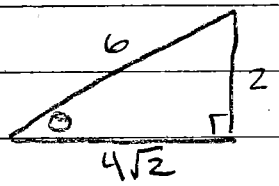
7. 

$9^2+b^2=41^2$
$81+b^2=1681$
$b^2=1600$
$b=40$

$\sin\theta=\frac{9}{41}$	$\csc\theta=\frac{41}{9}$
$\cos\theta=\frac{40}{41}$	$\sec\theta=\frac{41}{40}$
$\tan\theta=\frac{9}{40}$	$\cot\theta=\frac{40}{9}$

11. 

$1^2+b^2=3^2$
$b^2=8$
$b=2\sqrt{2}$



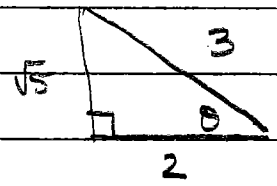
$2^2+b^2=6^2$
$b^2=32$
$b=4\sqrt{2}$

$\sin\theta=\frac{1}{3}$
$\cos\theta=\frac{2\sqrt{2}}{3}$
$\tan\theta=\frac{1}{2\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}=\frac{\sqrt{2}}{2\cdot 2}$
$=\frac{\sqrt{2}}{4}$

$\sin\theta=\frac{1}{3}$
$\cos\theta=\frac{2\sqrt{2}}{3}$
$\tan\theta=\frac{\frac{1}{3}}{\frac{2\sqrt{2}}{3}}=\frac{1}{2\sqrt{2}}$
$=\frac{\sqrt{2}}{4}$

The larger triangle is a scalar multiple of the smaller triangle, so the angles are the same.

15. $\sec\theta = \frac{3}{2}$ $\quad \sec\theta = \frac{\text{hyp}}{\text{adj}}$



$\sin\theta = \frac{\sqrt{5}}{3}$ $\quad \csc\theta = \frac{3\sqrt{5}}{5}$

$\cos\theta = \frac{2}{3}$ $\quad \sec\theta = \frac{3}{2}$

$\tan\theta = \frac{\sqrt{5}}{2}$ $\quad \cot\theta = \frac{2\sqrt{5}}{5}$

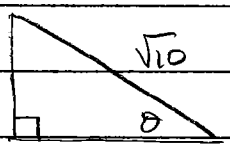
$2^2 + b^2 = 3^2$

$4 + b^2 = 9$

$b^2 = 5$

$b = \sqrt{5}$

19. $\cot\theta = 3$ $\quad \cot\theta = \frac{\text{adj}}{\text{hyp}}$



$3^2 + 1^2 = c^2$

$10 = c^2$

$\sqrt{10} = c$

$\sin\theta = \frac{\sqrt{10}}{10}$ $\quad \tan\theta = \frac{1}{3}$ $\quad \sec\theta = \frac{\sqrt{10}}{3}$

$\cos\theta = \frac{3\sqrt{10}}{10}$ $\quad \csc\theta = \sqrt{10}$

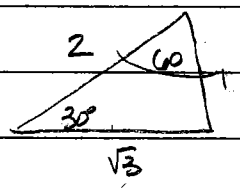
	Function	θ(deg)	θ(rad)	Function value
23.	sec	$45°$	$\frac{\pi}{4}$	$\frac{1}{\cos 45} = 1.414$
27.	csc	$30°$	$\frac{\pi}{6}$	$\frac{1}{\sin 30} = 2$

31. $\sin 60° = \frac{\sqrt{3}}{2}$ $\quad \cos 60 = \frac{1}{2}$

$\sin 30° = \frac{1}{2}$ $\quad \cos 30° \frac{\sqrt{3}}{2}$

$\tan 60° = \sqrt{3}$ $\quad \cot 60° = \frac{\sqrt{3}}{3}$

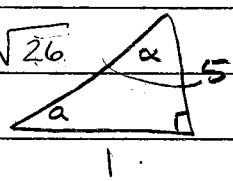
$= \frac{1}{}$



35. $\cot\alpha = 5$

$\tan\alpha = \frac{1}{5}$ $\quad \csc\alpha = \sqrt{26}$

$\cot(90-\alpha) = \frac{1}{5}$ $\quad \cos\alpha = \frac{5\sqrt{26}}{26}$



6.2 HW (cont'd)

37. $\tan\theta \cdot \frac{1}{\tan\theta} = 1$

$\frac{\tan\theta}{\tan\theta} = 1$

$1 = 1$

(39) $\tan\alpha \cos\alpha = \sin\alpha$

$\frac{\sin\alpha}{\cos\alpha} \cdot \cos\alpha = \sin\alpha$

$\sin\alpha = \sin\alpha$

41. $(1+\sin\theta)(1-\sin\theta) = \cos^2\theta$

$1 - \sin^2\theta = \cos^2\theta$

$\cos^2\theta = \cos^2\theta$

(43) $(\sec\theta+\tan\theta)(\sec\theta-\tan\theta) = 1$

$\sec^2\theta - \tan^2\theta = 1$

$1 = 1$

45. $\frac{\sin\theta}{\cos\theta}\cdot\frac{\sin\theta}{\sin\theta} + \frac{\cos\theta}{\sin\theta}\cdot\frac{\cos\theta}{\cos\theta} = \csc\theta\sec\theta$

$\frac{\sin^2\theta}{\cos\theta\sin\theta} + \frac{\cos^2\theta}{\sin\theta\cos\theta} = \csc\theta\sec\theta$

$\frac{1}{\cos\theta\sin\theta} = \csc\theta\sec\theta$

$\csc\theta\sec\theta = \csc\theta\sec\theta$

Degree Mode

47. $\tan 23.5^\circ = .435$

$\cot 66.5^\circ = \frac{1}{\tan 66.5} = .435$

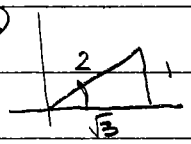
Radian Mode

51. a) $\cot\frac{\pi}{16} = \frac{1}{\tan\frac{\pi}{16}}$

$= 5.027$

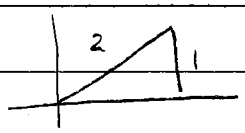
b) $\tan\frac{\pi}{16} = .199$

55. (a)

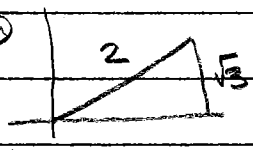


30° or $\frac{\pi}{6}$

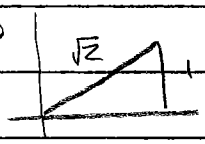
(b)



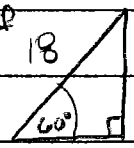
30° or $\frac{\pi}{6}$

59. (a) 

60° or $\frac{\pi}{3}$

(b) 

45° or $\frac{\pi}{4}$

61. 

$\sin 60 = \frac{y}{18}$ · 18

$18\sin 60 = y$

$15.588 = y$

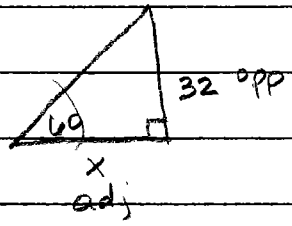
OR 30-60-90

1 $\sqrt{3}$ 2

x y 18

$2y = 18\sqrt{3}$

$y = 9\sqrt{3}$

63. 

$\tan 60 = \frac{32}{x}$

$x\tan 60 = 32$

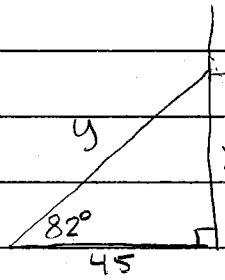
$\frac{x\tan 60}{\tan 60} = \frac{32}{\tan 60}$

$x = 18.475$

$\frac{x}{1} = \frac{32}{\sqrt{3}}$

$x\sqrt{3} = 32$

$x = \frac{32\sqrt{3}}{3}$

65. 

(a) $\tan 82 = \frac{x}{45}$

$45\tan 82 = x$

$320.192 = x$

$320.192 + 123 = 443.192\text{m}$

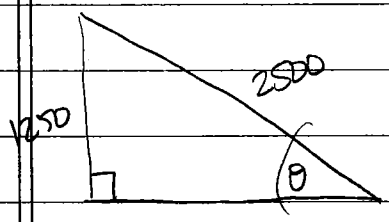
(b) $45^2 + 320.192^2 = y^2$

$104547.9169 = y^2$

$323.339\text{ m} = y$

6.2 hw cont'd

67.

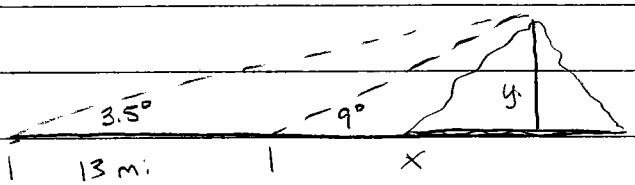


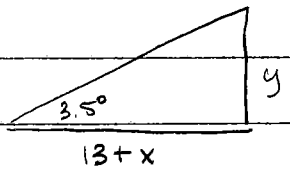
$\sin\theta = \frac{1250}{2500}$

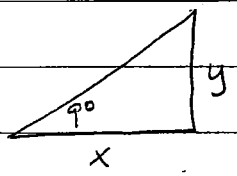
$\theta = \sin^{-1}\left(\frac{1}{2}\right)$

$= \boxed{30°}$

70.







$\tan 3.5 = \frac{y}{13+x}$

$\tan 9° = \frac{y}{x}$

$\boxed{x\tan 9} = y$

$(13+x)\tan 3.5 = \frac{x\tan 9°}{13+x} \cdot (13+x)$

$\tan 3.5(13+x) = x\tan 9°$

$13\tan 3.5 + x\tan 3.5 = x\tan 9°$

$13\tan 3.5 = x\tan 9 - x\tan 3.5$

$\frac{13\tan 3.5}{\tan 9 - \tan 3.5} = \frac{x(\tan 9 - \tan 3.5)}{\tan 9 - \tan 3.5}$

$x = 8.178$

$y = x\tan 9$

$y = 8.178(\tan 9)$

$= \boxed{1.295 \text{ miles}}$