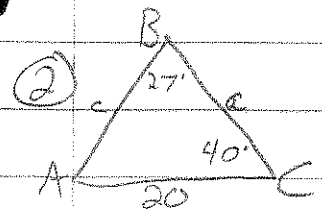
Geometry

Ch. 14 Review Evans

* All triangles not to scale

(2)

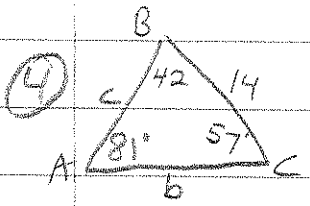


$m\angle A = 113°$

$\frac{\sin 27°}{20} = \frac{\sin 113°}{a}$ $\quad$ $\frac{\sin 27°}{20} = \frac{\sin 40}{c}$

$a = 40.6$ $\quad$ $c = 28.3$

(4)

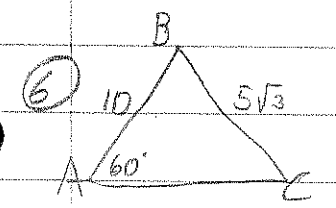


$m\angle A = 81°$

$\frac{\sin 81°}{14} = \frac{\sin 42°}{b}$ $\quad$ $\frac{\sin 81°}{14} = \frac{\sin 57°}{c}$

$b = 9.5$ $\quad$ $c = 11.9$

(6)



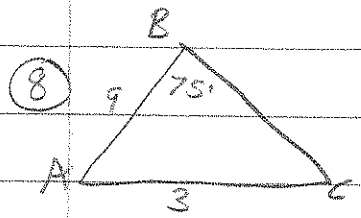
$\frac{\sin 60}{5\sqrt{3}} = \frac{\sin C}{10}$

$\frac{5\sqrt{3}}{5\sqrt{3}} = \sin C$

$1 = \sin C$

$90° = \angle C$ $\quad$ only one $\triangle$ $\quad$ $b = 5$ $\quad$ $\angle B = 30°$

(8)

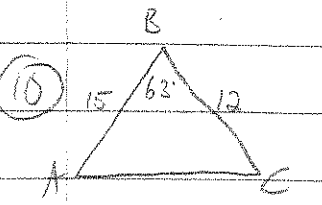


$\frac{\sin 75}{3} = \frac{\sin C}{9}$

$2.89 = \sin C$

No $\triangle$'s

(10)



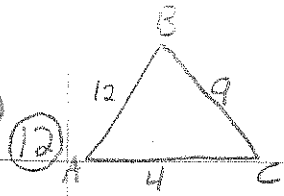
$b^2 = 15^2 + 12^2 - 2(15)(12)(\cos 63°)$

$b \approx 14.3$

$\frac{\sin 63}{14.3} = \frac{\sin C}{15}$

$.9346 = \sin C$

$\angle C = 69.2°$ $\quad$ $\angle A = 47.8°$

(12) 

$12^2 = 9^2 + 4^2 - 2(9)(4)\cos C$

$47 = -72\cos C$

$\frac{47}{-72} = \cos C$

$130.8^\circ = \angle C$

$\frac{\sin 130.8}{12} = \frac{\sin A}{9}$

$\angle A = 34.6^\circ$

$\angle B = 14.6^\circ$

(14) $(\sec\theta)(\cos^2\theta)$

$\frac{1}{\cos\theta} \cdot \frac{\cos^2\theta}{1} = \cos\theta$

(16) $\frac{2\cos^2\theta}{1-\sin^2\theta} = \frac{2\cos^2\theta}{\cos^2\theta} = 2$

(18) $\sin 45\cos 210 - \sin 210\cos 45$

$\left(\frac{\sqrt{2}}{2}\right)\left(\frac{-\sqrt{3}}{2}\right) - \left(\frac{-1}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$

$\frac{-\sqrt{6}}{4} + \frac{\sqrt{2}}{4} = \frac{\sqrt{2}-\sqrt{6}}{4}$

(20) $\cos 90^\circ\cos 60^\circ - \sin 90^\circ\sin 60^\circ$

$0 \cdot \frac{1}{2} - (1)\left(\frac{\sqrt{3}}{2}\right)$

$-\frac{\sqrt{3}}{2}$

(22) $\sin 195^\circ = \sin(150+45) = \sin 150^\circ\cos 45^\circ + \sin 45^\circ\cos 150^\circ$

$\left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{\sqrt{2}}{2}\right)\left(\frac{-\sqrt{3}}{2}\right)$

$\frac{\sqrt{2}}{4} - \frac{\sqrt{6}}{4} = \frac{\sqrt{2}-\sqrt{6}}{4}$

(24) $-\frac{\sqrt{3}}{2}$ angle is on unit circle, no need for $\cos(A \pm B)$

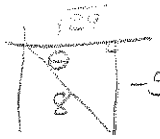
(26) Didn't do these Problems

(28)

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

$= 2\left(\frac{1}{8}\right)^2 - 1 = 2\left(\frac{1}{64}\right) - 1 = \frac{1}{32} - \frac{32}{32} = \frac{-31}{32}$

(30) ~~(34)~~ Didn't do these problems



(32) $\sin 2\theta = 2\sin\theta\cos\theta = 2\left(\frac{-5}{8}\right)\left(\frac{\sqrt{39}}{8}\right) = \boxed{\frac{-5\sqrt{39}}{32}}$

~~(34)~~ (36) $\sin 2\theta + \cos 2\theta$

$2\sin\theta\cos\theta + \cos^2\theta - \sin^2\theta$

Ignore

(38) $2\cos\theta - \sqrt{2} = 0$

$2\cos\theta = \sqrt{2}$

$\cos\theta = \frac{\sqrt{2}}{2}$

$\theta = 45^\circ \& 315^\circ$

(40) $2\cos^2\theta - \cos\theta - 1 = 0$

$(2\cos\theta + 1)(\cos\theta - 1) = 0$

$2\cos\theta + 1 = 0$ $\qquad$ $\cos\theta - 1 = 0$

$\cos\theta = \frac{-1}{2}$ $\qquad$ $\cos\theta = 1$

$\theta = 120^\circ, 240^\circ$ $\qquad$ $\theta = 0^\circ$

(42) $4(1-\cos^2\theta) + 4\cos\theta - 1 = 0$

$[-4\cos^2\theta + 4\cos\theta + 3 = 0] \cdot -1$ (makes $\cos^2\theta$ term positive)

$4\cos^2\theta - 4\cos\theta - 3 = 0$

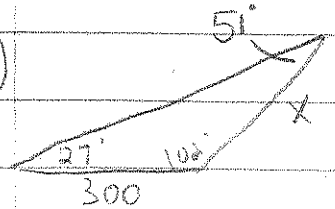
$(2\cos\theta - 3)(2\cos\theta + 1) = 0$

$2\cos\theta - 3 = 0$ $\qquad$ $2\cos\theta + 1 = 0$

$\cos\theta = \frac{3}{2}$ $\qquad$ $\cos\theta = \frac{-1}{2}$

No answers here $\qquad$ $\theta = 120^\circ, 240^\circ$

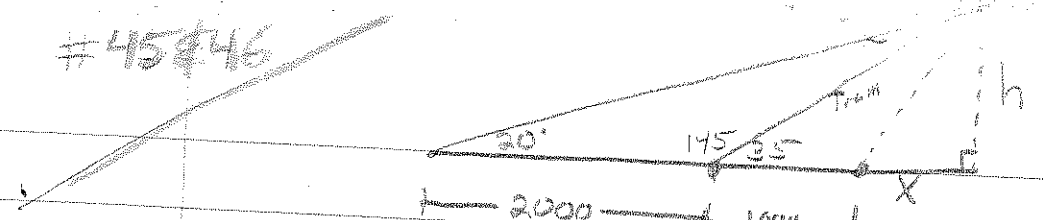
(44)



$\frac{\sin 51^\circ}{300} = \frac{\sin 27^\circ}{x}$

$x = 175.25\text{ m}$

#45 & 46



$\tan 20^\circ = \frac{h}{3000+x}$ $\quad \tan 35^\circ = \frac{h}{1000+x}$

$(3000+x)\tan 20^\circ = h$ $\quad h = (1000+x)\tan 35^\circ$

$3000\tan 20^\circ + x\tan 20^\circ = 1000\tan 35^\circ + x\tan 35^\circ$

$1091.911 + x\tan 20^\circ = 700.208 + x\tan 35^\circ$

$391.703 = x\tan 35^\circ - x\tan 20^\circ$

$391.703 = x(\tan 35^\circ - \tan 20^\circ)$

$\frac{391.703}{(\tan 35^\circ - \tan 20^\circ)} = x \approx 1164.96$

$\tan 35^\circ = \frac{h}{2164.96}$

#45 $h = 1516$ yd

$Tram^2 = 2164.96^2 + 1516^2$

$Tram \approx 2643$ yds

(48) $c^2 = 165^2 + 115^2 - 2(165)(115)(\cos 74^\circ)$

$c = 173.2$ m