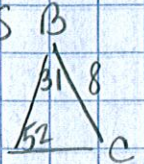
Pg. 262

1. ΔABC — AAS

$A = 52°$, $B = 31°$, $C = 97°$

$a = 8$ cm, $b = 5.23$ cm, $c = 10.08$ cm



$\frac{8}{\sin 52} = \frac{b}{\sin 31}$

$b = \frac{8 \sin 31}{\sin 52}$

$\boxed{b = 5.23}$

$\frac{8}{\sin 52} = \frac{c}{\sin 97}$

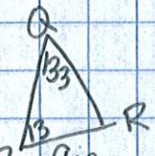
$c = \frac{8 \sin 97}{\sin 52}$

$\boxed{c = 10.08}$

2. ΔPQR — AAS

$P = 13°$, $Q = 133°$, $R = 34°$

$p = 2.77$ in, $q = 9$ in, $r = 6.88$ in



$\frac{9}{\sin 133°} = \frac{p}{\sin 13°}$

$p = \frac{9 \sin 13}{\sin 133°}$

$\boxed{p = 2.77}$

$\frac{9}{\sin 133} = \frac{r}{\sin 34}$

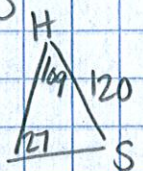
$r = \frac{9 \sin 34}{\sin 133}$

$\boxed{r = 6.88}$

3. ΔAHS — AAS

$A = 27°$, $H = 109°$, $S = 44°$

$a = 120$ yd., $h = 249.92$, $s = 183.61$



$\frac{120}{\sin 27} = \frac{h}{\sin 109}$

$h = \frac{120 \sin 109}{\sin 27}$

$\boxed{h = 249.92}$

$\frac{120}{\sin 27} = \frac{s}{\sin 44}$

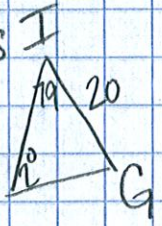
$s = \frac{120 \sin 44}{\sin 27}$

$\boxed{s = 183.61}$

4. ΔBIG — AAS

$B = 2°$, $I = 79°$, $G = 99°$

$b = 20$km, $i = 562.55$km, $g = 566.02$km



$\frac{20}{\sin 2°} = \frac{i}{\sin 79°}$

$i = \frac{20 \sin 79°}{\sin 2°}$

$\boxed{i = 562.55\text{km}}$

$\frac{20}{\sin 2°} = \frac{g}{\sin 99°}$

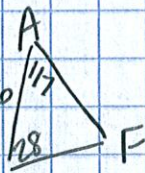
$g = \frac{20 \sin 99°}{\sin 2°}$

$\boxed{g = 566.02\text{km}}$

5. ΔPAF — ASA

$P = 28°$, $A = 117°$, $F = 35°$

$p = 4.91$m, $a = 9.32$m, $f = 6$m



$\frac{6}{\sin 35°} = \frac{a}{\sin 117°}$

$a = \frac{6 \sin 117°}{\sin 35°}$

$\boxed{a = 9.32}$

$\frac{6}{\sin 35°} = \frac{p}{\sin 28°}$

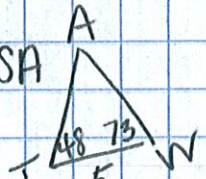
$p = \frac{6 \sin 28°}{\sin 35°}$

$\boxed{p = 4.91}$

6. ΔJAW — ASA

$J = 48°$, $A = 59°$, $W = 73°$

$j = 4.33$ft, $a = 5$ft, $w = 5.58$ft



$\frac{5}{\sin 59} = \frac{j}{\sin 48}$

$j = \frac{5 \sin 48}{\sin 59}$

$\boxed{j = 4.33}$

$\frac{5}{\sin 59} = \frac{w}{\sin 73°}$

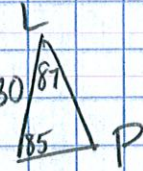
$w = \frac{5 \sin 73}{\sin 59}$

$\boxed{w = 5.58}$

7. ΔALP — ASA

$A = 85°$, $L = 87°$, $P = 8°$

$a = 214.74$, $l = 215.26$ft, $p = 30$ft



$\frac{30}{\sin 8°} = \frac{l}{\sin 87°}$

$l = \frac{30 \sin 87°}{\sin 8°}$

$\boxed{l = 215.26}$

$\frac{30}{\sin 8°} = \frac{a}{\sin 85°}$

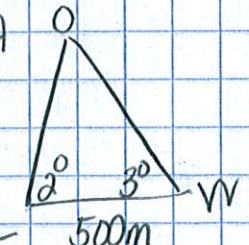
$a = \frac{30 \sin 85°}{\sin 8°}$

$\boxed{a = 214.74}$

8. ΔLOW — ASA

$L = 2°$, $O = 175°$, $W = 3°$

$l = 200.21$m, $o = 500$m, $w = 300.24$m



$\frac{500}{\sin 175°} = \frac{l}{\sin 2°}$

$l = \frac{500 \sin 2°}{\sin 175°}$

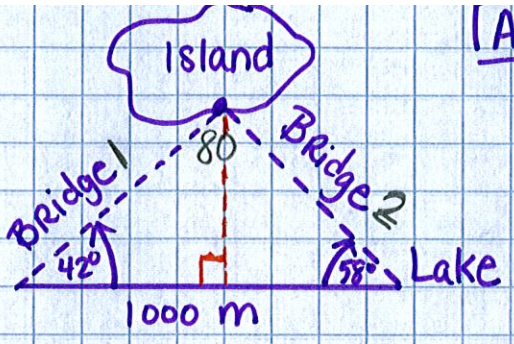
$\boxed{l = 200.21}$

$\frac{500}{\sin 175} = \frac{w}{\sin 3°}$

$w = \frac{500 \sin 3°}{\sin 175°}$

$\boxed{w = 300.24}$

9.



A. How long is each bridge?

$\frac{1000}{\sin 80} = \frac{B1}{\sin 58}$ $\quad B1 = 861.13\text{ m}$

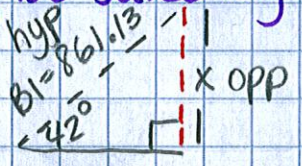
$\frac{1000}{\sin 80} = \frac{B2}{\sin 42}$ $\quad B2 = 679.45$

B Construction cost \$370 per meter, how much would be saved by constructing the shorter bridge?

$B1 - B2 = 861.13 - 679.45 = 184.68\text{m}(370^{\text{00}}) = \$68,331.60$

C. How much could be saved by constructing the shortest possible bridge?

X = shortest bridge



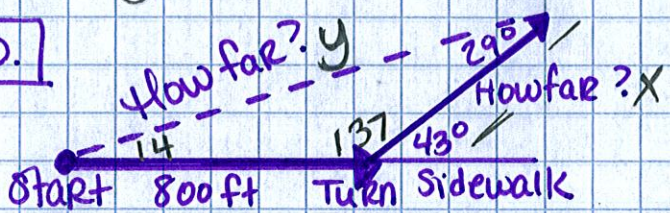
$\sin\theta = \frac{opp}{hyp}$ $\quad \sin 42^\circ = \frac{x}{861.13}$

$x = 861.13\sin 42^\circ$ $\quad x = 576.21$

$B1 = 370(861 - 576) = 105,420.40$

$B2 = 370(679 - 576) = 38,198.80$

10.



A. How far across the field did Amos walk?

$\frac{800}{\sin 29^\circ} = \frac{x}{\sin 14^\circ}$ $\quad x = \frac{800\sin 14^\circ}{\sin 29}$

$x = 299.2\text{ft}$

B. How far does he have to walk to go directly back to the starting point?

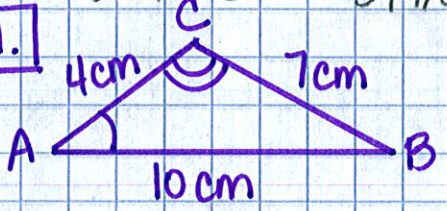
$\frac{800}{\sin 29} = \frac{y}{\sin 37^\circ}$ $\quad y = \frac{800\sin 137}{\sin 29} = 1125.39\text{ feet}$

C. Amos walks 5ft/s on the sidewalk but only 3ft/s across the field. Which way is quicker for him to return to start pt?

$\frac{800\text{ft}}{5\text{ft/sec}} + \frac{299.2\text{ft}}{3\text{ft/sec}} = 260\text{ seconds}$ go back the same way

$\frac{1125.39\text{ft}}{3\text{ft/sec}} = 375.13\text{ seconds}$

11.



A. Use law of cosines to find measure of angle A.

$A = \cos^{-1}\left(\frac{7^2 - 4^2 - 10^2}{-2(4)(10)}\right) = 33.12^\circ$

B. Use answer from A and law of sines to find C.

$\frac{7}{\sin 33.12} = \frac{10}{\sin C}$ $\quad \sin C = \frac{10\sin 33.12}{7}$ $\quad C = \sin^{-1}\left(\frac{10\sin 33.12}{7}\right)$

$C = 51.31^\circ$

C. Find measure of angle C again using law of cosines.

$C = \cos^{-1}\left(\frac{10^2 - 7^2 - 4^2}{-2(7)(4)}\right) = 128.68$