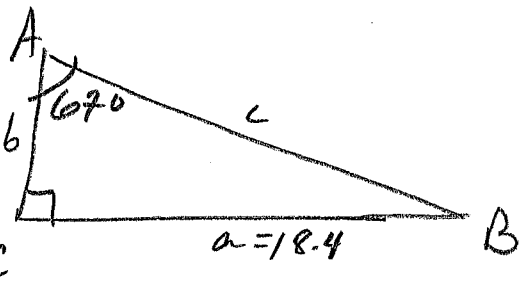
Solutions

II (6) Given:

$\angle C = 90°$

$\angle A = 67°$

$a = 18.4\text{cm}$



Find

$\angle B = 23°$

$b = 7.8\text{cm}$

$c = 20.0\text{cm}$

$\angle B$: $\angle B = 90 - \angle A$

$= 90 - 67$

$= 23°$

b: $\tan(67°) = \frac{18.4}{b}$

$\Rightarrow b \cdot \tan(67°) = 18.4$

$\Rightarrow b = \frac{18.4}{\tan(67°)}$

$= 7.810336$

$= 7.8$

c: $\sin(67°) = \frac{18.4}{c}$

$\Rightarrow c \cdot \sin(67°) = 18.4$

$\Rightarrow c = \frac{18.4}{\sin(67°)}$

$= 19.98903\ldots$

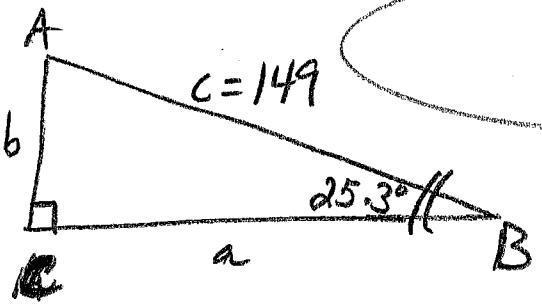
$= 20.0$

(7). Given

$\angle C = 90°$

$\angle B = 25.3°$

$c = 149\text{ft}$



Find:

$\angle A = 64.7°$

$a = 134.7\text{ft}$

$b = 63.7\text{ft}$

$\angle A$: $\angle A = 90 - \angle B$

$= 90 - 25.3$

$= 64.7°$

a: $\cos(25.3°) = \frac{a}{149}$

$\Rightarrow a = 149 \cdot \cos(25.3°)$

$= 134.70829\ldots$

$= 134.7$

b: $\sin(25.3°) = \frac{b}{149}$

$\Rightarrow b = 149 \cdot \sin(25.3°)$

$= 63.67632\ldots$

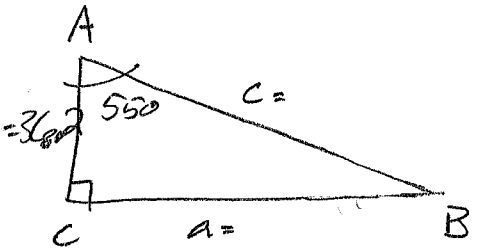
$= 63.7$

(8). Given:

$\angle C = 90°$

$\angle A = 55°$

$b = 36.2$ m



Find:

$\angle B = 35°$

$a = 51.7$ m

$c = 63.1$ m

$\angle B$:

$\angle B = 90 - 55°$

$= 35°$

a:

$\frac{\tan(55°)}{1} = \frac{a}{36.2}$

$\Rightarrow a = 36.2 \tan(55°)$

$= 51.69895\ldots$

$= 51.7$

c:

$\frac{\cos(55)}{1} = \frac{36.2}{c}$

$\Rightarrow c \cdot \cos(55) = 36.2$

$\Rightarrow c = \frac{36.2}{\cos(55)}$

$= 63.11277\ldots$

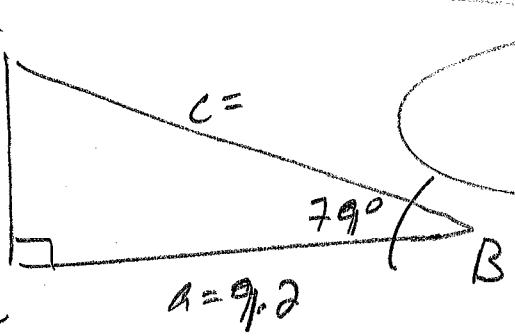
$= 63.1$

(9) Given

$\angle C = 90°$

$\angle B = 79°$

$a = 9.2$ in



Find:

$\angle A = 11°$

$b = 47.3$ in

$c = 48.2$ in

$\angle A$:

$\angle A = 90 - 79°$

$= 11°$

b:

$\frac{\tan(79°)}{1} = \frac{b}{9.2}$

$\Rightarrow b = (9.2) \cdot \tan(79°)$

$= 47.32989\ldots$

$= 47.3$

c:

$\frac{\cos(79°)}{1} = \frac{9.2}{c}$

$\Rightarrow c \cos(79°) = 9.2$

$\Rightarrow c = \frac{9.2}{\cos(79°)}$

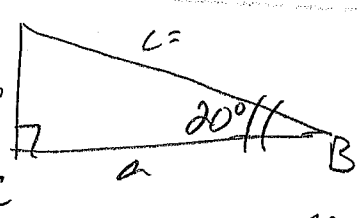
$= 48.21575\ldots$

$= 48.2$

(10). $\angle C = 90°$

$\angle B = 20°$

$b = 88.8$ cm



Find:

$\angle A = 70°$

$a = 244.0$ cm

$c = 259.6$ cm

$\angle A$:

$\angle A = 90 - \angle B$

$= 90 - 20$

$= 70°$

a:

$\frac{\tan(20°)}{1} = \frac{88.8}{a}$

$\Rightarrow a \cdot \tan(20°) = 88.8$

$\Rightarrow a = \frac{88.8}{\tan(20°)}$

$= 243.97559 \Rightarrow 244.0$

c:

$\frac{\sin(20°)}{1} = \frac{88.8}{c}$

$c \cdot \sin(20°) = 88.8$

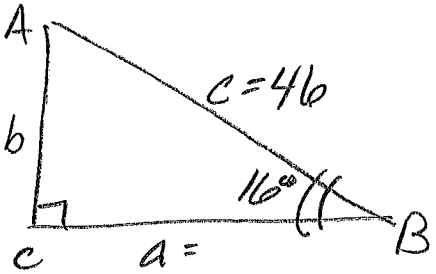
$\Rightarrow c = 88.8 / \sin(20°)$

$= 259.63383\ldots$

$= 259.6$

By Shree

(11) Given:
$\angle B = 16°$
$\angle C = 90°$
$c = 46m$



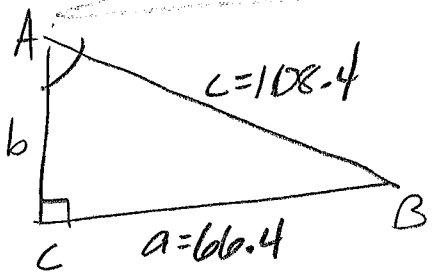
Find:
$\angle A = 74°$
$a = 44.2\ m$
$b = 12.7\ m$

$\angle A$:
$\angle A = 90 - \angle B$
$= 90 - 16$
$= 74°$

a:
$\frac{\cos(16°)}{1} = \frac{a}{46}$
$\Rightarrow a = 46 \cdot \cos(16°)$
$= 44.21803...$
$= 44.2$

b:
$\frac{\sin(16°)}{1} = \frac{b}{46}$
$\Rightarrow b = 46 \cdot \sin(16°)$
$= 12.67931...$
$= 12.7$

(12) Given:
$\angle C = 90°$
$a = 66.4cm$
$c = 108.4cm$



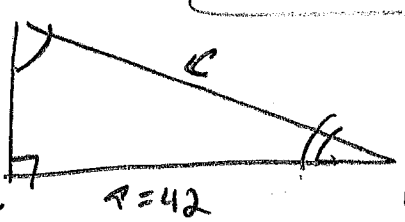
Find:
$\angle A = 37.8°$
$\angle B = 52.2°$
$b = 85.6\ cm$

$\angle A$:
$\frac{\sin(A)}{1} = \frac{66.4}{108.4}$
$\Rightarrow 108.4 \cdot \sin(A) = 66.4$
$\Rightarrow \sin(A) = \frac{66.4}{108.4}$
$\Rightarrow A = \sin^{-1}\left(\frac{66.4}{108.4}\right)$
$\Rightarrow A = 37.77383...$
$= 37.8°$

$\angle B$:
$\angle B = 90 - \angle A$
$= 90 - 37.8$
$= 52.2°$

b:
$\frac{\tan(37.8°)}{1} = \frac{66.4}{b}$
$\Rightarrow b \cdot \tan(37.8) = 66.4$
$\Rightarrow b = \frac{66.4}{\tan(37.8°)}$
$= 85.60236...$
$= 85.6$

(13) Given:
$\angle C = 90°$
$a = 42\ m$
$b = 35m$



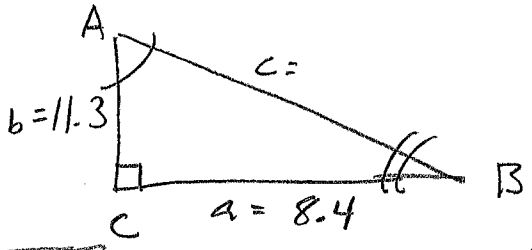
Find:
$\angle A = 50.2°$
$\angle B = 39.8°$
$c = 54.7\ m$

$\angle A$:
$\frac{\tan(A)}{1} = \frac{42}{35}$
$\Rightarrow 35 \cdot \tan(A) = 42$
$\Rightarrow \tan(A) = \frac{42}{35}$
$\Rightarrow A = \tan^{-1}(42/35)$
$= 50.19442... = 50.2$

$\angle B$:
$\angle B = 90 - \angle A$
$= 90 - 50.2$
$= 39.8$

c:
$\frac{\cos(50.2)}{1} = \frac{35}{c}$
$\Rightarrow c \cdot \cos(50.2) = 35$
$\Rightarrow c = \frac{35}{\cos(50.2)}$
$= 54.67812...$
$= 54.7$

(14.) Given:
$\angle C = 90°$
$a = 8.4$ cm
$b = 11.3$ cm



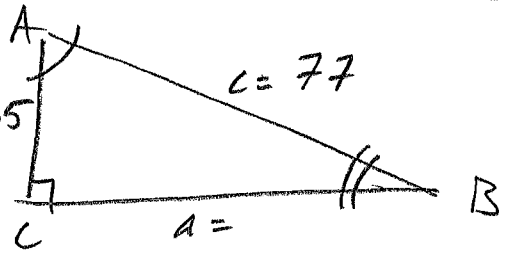
Find:
$\angle A = 36.6°$
$\angle B = 53.4°$
$c = 14.1$ cm

$\angle A$:
$\tan(A) = \frac{8.4}{11.3}$
$\Rightarrow A = \tan^{-1}\left(\frac{8.4}{11.3}\right)$
$= 36.62574\ldots$
$= 36.6°$

$\angle B$:
$\angle B = 90 - \angle A$
$= 90 - 36.6$
$= 53.4°$

c:
$\frac{\cos(36.6°) = \frac{11.3}{c}}{1}$
$\Rightarrow c \cdot \cos(36.6°) = 11.3$
$\Rightarrow c = \frac{11.3}{\cos(36.6°)}$
$= 14.07542\ldots$
$= 14.1$

(15.) Given
$\angle C = 90°$
$b = 65$ m
$c = 77$ m



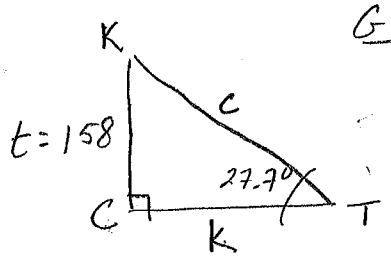
Find:
$\angle A = 32.4°$
$\angle B = 57.6°$
$a = 41.3$ m

$\angle A$:
$\cos(A) = \frac{65}{77}$
$\Rightarrow A = \cos^{-1}\left(\frac{65}{77}\right)$
$= 32.41839\ldots$
$= 32.4°$

$\angle B$:
$\angle B = 90 - \angle A$
$= 90 - 32.4$
$= 57.6°$

a:
$\frac{\tan(32.4°) = \frac{a}{65}}{1}$
$\Rightarrow a = 65 \cdot \tan(32.4°)$
$= 41.25025\ldots$
$= 41.3$

(16.)



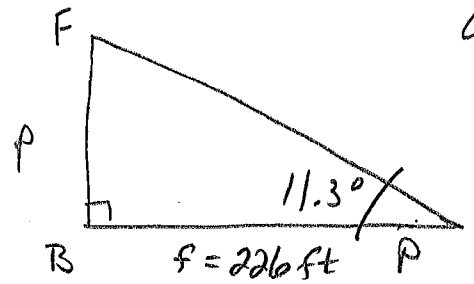
Given:
$\angle C = 90°$
$\angle T = 27.2°$
$t = 158$ m

Find:
(a) $k = 300.9$ m
(b) $c = 339.9$ m

(a) Find k:
$\frac{\tan(27.7°) = \frac{158}{k}}{1}$
$\Rightarrow k \cdot \tan(27.7°) = 158$
$\Rightarrow k = 158/\tan(27.7°)$
$= 300.94565\ldots$
$= 300.9$ m

(b) Find c:
$\frac{\sin(27.7°) = \frac{158}{c}}{1}$
$\Rightarrow c \cdot \sin(27.7°) = 158$
$\Rightarrow c = 158/\sin(27.7°)$
$= 339.90040\ldots$
$= 339.9$ m

(17.)



Given: $\angle B = 90°$
$f = 226$ ft
$\angle P = 11.3°$

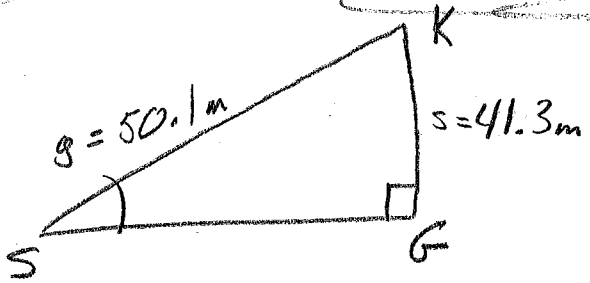
Find: p

$\frac{\tan(11.3°)}{1} = \frac{p}{226}$

$\Rightarrow p = 226 \cdot \tan(11.3°)$
$= 45.15925\ldots$
$= 45.2$ ft

$p = 45.2$ ft

#18



given
$\angle G = 90°$
$s = 41.3$m
$g = 50.1$m

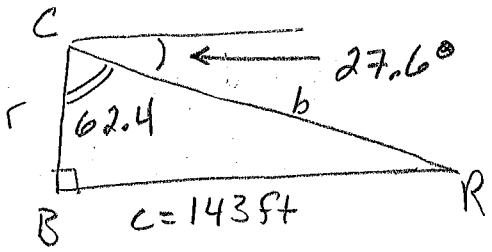
Find:
$\angle S = 55.5°$

$\angle S$: $\sin(\angle S) = \frac{41.3}{50.1}$

$\Rightarrow \angle S = \sin^{-1}\left(\frac{41.3}{50.1}\right)$

$\angle S = 55.52277\ldots$
$= 55.5°$

#19



Find:
(a) $\angle R = 27.6°$
(b) $r = 74.8$ ft

Given:
$\angle B = 90°$
$c = 143$ ft
Coyote's angle of depression = 27.6
so $\angle BCR = 90 - 27.6 = 62.4°$

(a):
$\angle R = 90 - \angle BCR$
$= 90 - 62.4°$
$= 27.6°$

(b) $\frac{\tan(62.4°)}{1} = \frac{143}{r}$

$\Rightarrow r \cdot \tan(62.4) = 143$

$\Rightarrow r = 143/\tan(62.4)$
$= 74.75859\ldots$
$= 74.8$ ft

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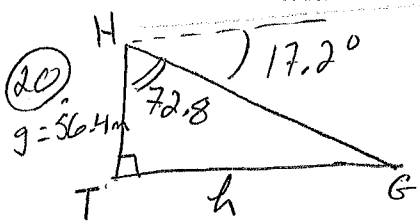
(20)



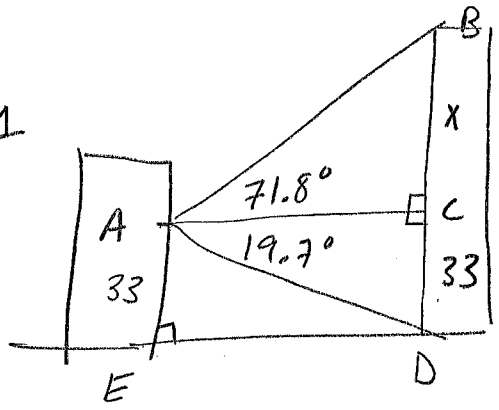
Find
$h = 182.2$m

Given: $g = 56.4$
$\angle$ of depres $= 17.2°$
$\Rightarrow \angle THG = 90 - 17.2° = 72.8°$

h:
$\frac{\tan(72.8°)}{1} = \frac{h}{56.4}$

$\Rightarrow h = 56.4 \cdot \tan(72.8°)$
$= 182.19896\ldots$
$= 182.2$ m

(21) #1



#2 Given:

$AE = 33$

so $CD = 33$

$\measuredangle DAC = 19.7°$

$\measuredangle CAB = 71.8°$

Find $BD =$ ____ m

NOTE:

We may use $CD = 33$ in ΔADC to find length AC

Then switch to ΔABC and use the AC value to find $X = BC$

Finally Notice:

$BD = BC + CD$

SO in ΔADC

$$\frac{\tan(19.7°)}{1} = \frac{33}{AC}$$

$$\Rightarrow AC \cdot \tan(19.7°) = 33$$

$$\Rightarrow AC = \frac{33}{\tan(19.7°)}$$

$$= 92.16542\ldots$$

$$= 92.2$$

NOW, SWITCHING TO ΔABC:

$$\frac{\tan(71.8°)}{1} = \frac{X}{92.2}$$

$$\Rightarrow X = 92.2 \cdot \tan(71.8°)$$

$$= 280.42789\ldots$$

$$= 280.4$$

SO Finally:

Height of BLDG #2 = BD

$BD = BC + CD$

$= 280.4 + 33$

$= \boxed{313.4\ m}$