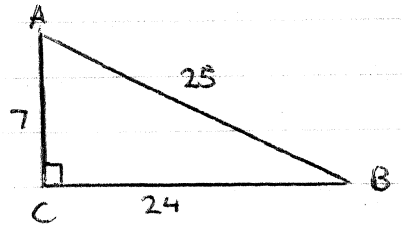
Geometry Ch 7-5 Exer, pg 463 #1, 3-8, 18-20, 21-23, 24-26, 27-29

1. The tangent ratio compares the length of <u>the opposite leg</u> to the length of <u>the adjacent leg.</u>

Find tan A and tan B. Write each answer as both a fraction and as a decimal rounded to four places.

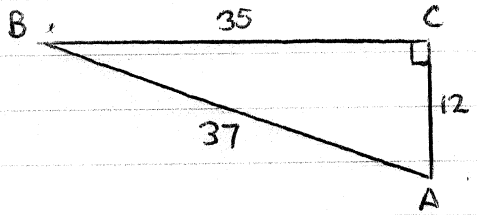
3.



$\tan A = \frac{24}{7} = 3.4286$

$\tan B = \frac{7}{24} = 0.2917$

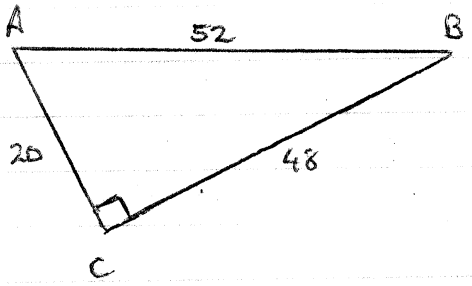
4.



$\tan A = \frac{35}{12} = 2.9167$

$\tan B = \frac{12}{35} = 0.3429$

5.

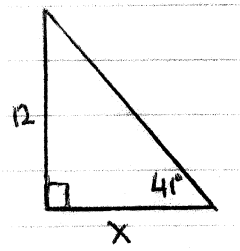


$\tan A = \frac{48}{20} = 2.4000$

$\tan B = \frac{20}{48} = 0.4167$

Find the value of x to the nearest tenth.

6



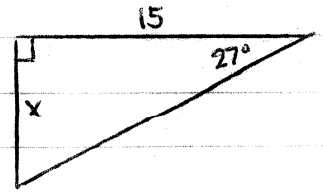
$\frac{12}{x} = \tan 41°$

$\frac{12}{\tan 41°} = x$

$\frac{12}{.8693} = x$

$\boxed{13.8 = x}$

7.



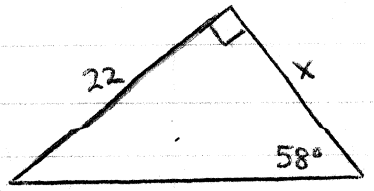
$\frac{x}{15} = \tan 27°$

$x = 15 \tan 27°$

$x = 15(.5095)$

$\boxed{x = 7.6}$

8.



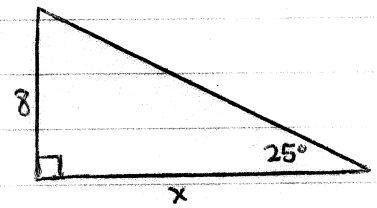
$\frac{22}{x} = \tan 58°$

$\frac{22}{\tan 58°} = x$

$\frac{22}{1.6003} = x$

$\boxed{13.7 = x}$

18.



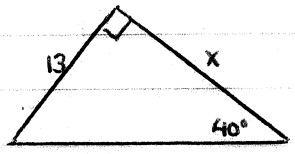
$\frac{8}{x} = \tan 25°$

$\frac{8}{\tan 25°} = x$

$\frac{8}{.4663} = x$

$\boxed{17.2 = x}$

19.



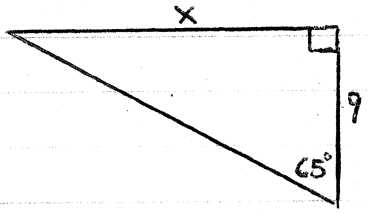
$\frac{13}{x} = \tan 40°$

$\frac{13}{\tan 40°} = x$

$\frac{13}{.8391} = x$

$\boxed{15.5 = x}$

20.



$\frac{x}{9} = \tan 65°$

$x = 9 \tan 65°$

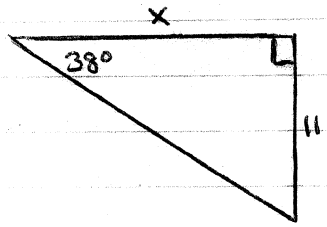
$x = 9(2.1445)$

$\boxed{x = 19.3}$

$\text{Area} = \frac{1}{2}bh$

Find the Area of the triangle. Round to nearest tenth.

21.



$\tan 38 = \frac{11}{x}$

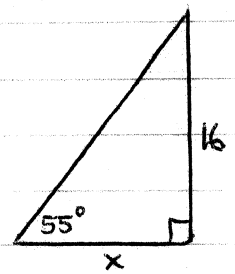
$x = \frac{11}{\tan 38}$

$x = 14.1$

$\text{Area} = \frac{1}{2}(11)(14.1)$

$\boxed{\text{Area} = 77.6}$

22.



$\tan 55 = \frac{16}{x}$

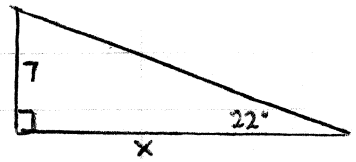
$x = \frac{16}{\tan 55}$

$x = 11.2$

$\text{Area} = \frac{1}{2}(11.2)(16)$

$\boxed{\text{Area} = 89.6}$

23.



$\frac{7}{x} = \tan 22$

$\frac{7}{\tan 22} = x$

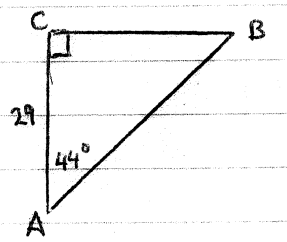
$17.3 = x$

$\text{Area} = \frac{1}{2}(7)(17.3)$

$\boxed{\text{Area} = 60.6}$

Find perimeter of triangle. Round to the nearest tenth.

24.



$\tan 44 = \frac{CB}{29}$

$28.0 = CB$

$AB^2 = AC^2 + CB^2$

$AB = \sqrt{(29)^2 + (28)^2}$

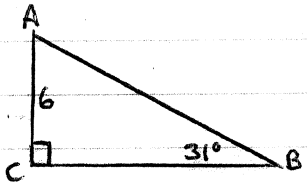
$AB = \sqrt{1625} = 40.3$

$\text{Perim} = AC + CB + AB$

$= 29 + 28 + 40.3$

$= \boxed{97.3}$

25.



$\tan 31 = \frac{6}{CB}$

$CB = 10.0$

$AB^2 = AC^2 + CB^2$

$AB = \sqrt{(6)^2 + (10.0)^2}$

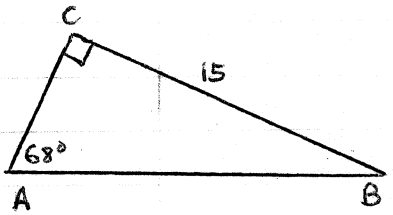
$AB = \sqrt{136} = 11.7$

$\text{Perim} = AC + CB + AB$

$= 6 + 10.0 + 11.7$

$= \boxed{27.7}$

26.



$\tan 68° = \frac{15}{AC}$

$AC = 6.1$

$AB^2 = AC^2 + CB^2$

$AB = \sqrt{(6.1)^2 + (15)^2}$

$AB = \sqrt{262.21} = 16.2$

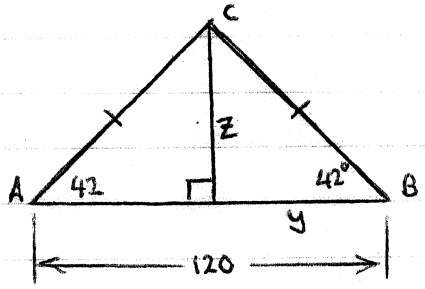
$\text{Perim} = AC + AB + CB$

$= 6.1 + 16.2 + 15$

$= \boxed{37.3}$

Find y. Then find z. Round to the nearest tenth.

27.



Because of $\cong$ symbols at $\overline{AC}$ and $\overline{BC}$, $\triangle ABC$ is isosceles. The altitude from C will bisect $\overline{AB}$. Therefore,

$y = \frac{1}{2}(120)$

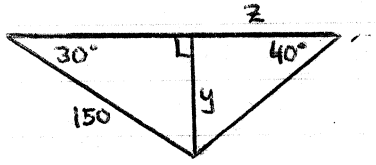
$\boxed{y = 60}$

$\frac{z}{60} = \tan 42$

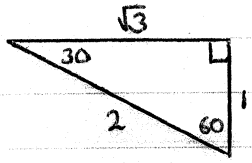
$z = 60 \tan 42$

$\boxed{z = 54.0}$

28.



Recall proportions of 30-60-90 $\triangle$:



$\frac{y}{150} = \frac{1}{2}$

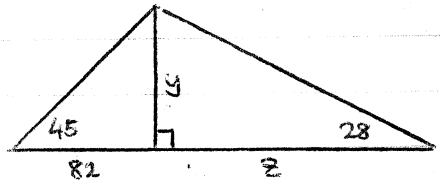
$\boxed{y = 75}$

$\tan 40 = \frac{75}{z}$

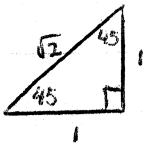
$z = \frac{75}{\tan 40}$

$\boxed{z = 89.4}$

29



Recall proportions of 45-45-90 $\triangle$:



$\frac{y}{82} = \frac{1}{1}$

$\boxed{y = 82}$

$\tan 28 = \frac{82}{z}$

$z = \frac{82}{\tan 28}$

$\boxed{z = 154.2}$