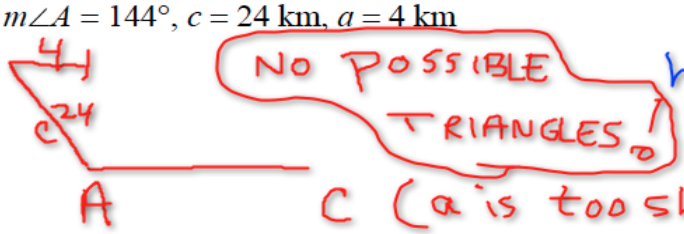
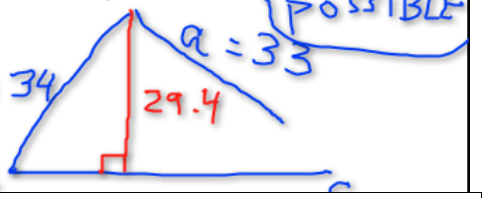
State the number of possible triangles that can be formed using the given measurements.

1) $m\angle A = 144°$, $c = 24$ km, $a = 4$ km



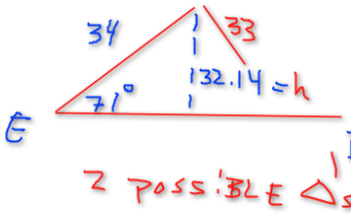
2) $m\angle A = 60°$, $c = 34$ mi, $a = 33$ mi

$h = c \sin A$
$= 34 \sin 60$
$= 29.4$



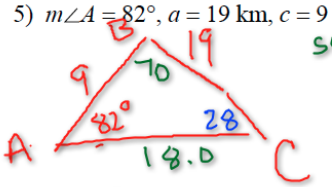
3) In $\triangle BCA$, $m\angle B = 110°$, $a = 13$ yd, $b = 30$ yd

4) In $\triangle EFD$, $m\angle E = 71°$, $d = 34$ m, $e = 33$ m



$h = 34 \sin 71°$
$= 32.14$

5) $m\angle A = 82°$, $a = 19$ km, $c = 9$ km



$\frac{\sin 82}{19} = \frac{\sin 70}{b}$

$b = \frac{19 \sin 70}{\sin 82}$

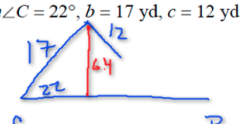
$19 > 9 \Rightarrow$ 1 Δ POSSIBLE $b = 18.0$

$\frac{\sin 82}{19} = \frac{\sin C}{9}$

$\sin C = \frac{9 \sin 82}{19} = .4691$

$m\angle B = 70, b = 18$
$m\angle C = 28$
$c = 28.0$

6) $m\angle C = 22°$, $b = 17$ yd, $c = 12$ yd



$h = b \sin C$
$= 17 \sin 22$
$h = 6.368 \approx 6.4$

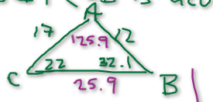
2 Δs POSSIBLE!

$\frac{\sin 22}{12} = \frac{\sin 125.9}{a}$

$a = \frac{12 \sin 125.9}{\sin 22} = 25.9$

$m\angle A = 125.9$, $m\angle B = 32.1$, $a = 25.9$

Δ #1 ($\angle B$ is acute)



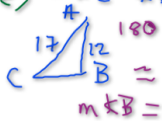
$\frac{\sin 22}{12} = \frac{\sin B}{17}$

$\sin B = \frac{17 \sin 22}{12}$

$\sin B = .5307$

$m\angle B \approx 32.05226$
$m\angle B \approx 32.1°$
$\therefore m\angle A = 125.9°$

Δ #2 $\angle B$ is OBTUSE



$180 - 32.1$
$B \approx 147.9$
$m\angle B = 147.9°$
$m\angle A = 10.1°$

$\frac{\sin C}{c} = \frac{\sin A}{a}$

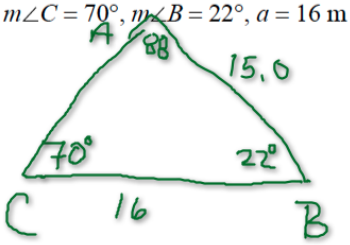
$\frac{\sin 22}{12} = \frac{\sin 10.1}{a}$

$a = \frac{12 \sin 10.1}{\sin 22}$

$a = 5.6$

$m\angle A = 10.1$ $m\angle B = 147.9°$ $m\angle C = 22°$
$a = 5.6$ $b = 17$ $c = 12$

7) $m\angle C = 70°$, $m\angle B = 22°$, $a = 16$ m



$m\angle A = 180 - 92$

$\frac{\sin 88}{16} = \frac{\sin 70}{c}$

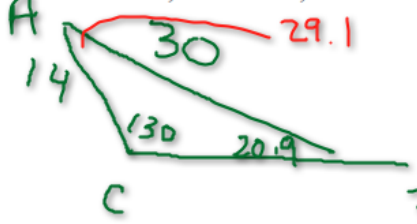
$c = \frac{16 \sin 70}{\sin 88} = 15.0$

$\frac{\sin 88}{16} = \frac{\sin 22}{b}$

$b = \frac{16 \sin 22}{\sin 88}$

$m\angle A = 88°$, $c = 15$, $b = 6$

8) $m\angle C = 130°$, $b = 14$ m, $c = 30$ m



1 POSSIBLE Δ

$\frac{\sin 130}{30} = \frac{\sin B}{14}$

$\sin B = \frac{14 \sin 130}{30}$

$\sin B \approx .3579$

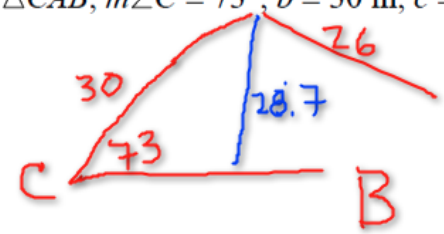
$m\angle B \approx 20.9$
$m\angle C \approx 29.1$

$\frac{\sin 130}{30} = \frac{\sin 29.1}{a}$

$a = \frac{30 \sin 29.1}{\sin 130}$

$a = 19.0$, $m\angle B \approx 20.9$, $m\angle C \approx 29.1$

9) In $\triangle CAB$, $m\angle C = 73°$, $b = 30$ in, $c = 26$ in



$h = 30 \sin 73$

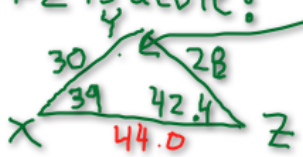
$h = 28.7$

C is too short!

NO POSSIBLE $\triangle$s

$\sin z = \frac{30 \sin 39}{28} = .6743$

$\angle Z$ is acute:

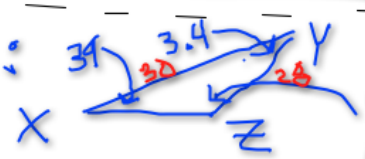


$\frac{\sin 39}{28} = \frac{\sin z}{30}$

$m\angle Z = 42.4°$

$m\angle Y = 98.6$

$\angle Z$ is OBTUSE:

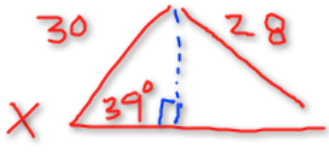


$\frac{\sin 39}{28} = \frac{\sin 3.4}{y}$

$y = \frac{28 \sin 3.4}{\sin 39}$

10) In $\triangle XYZ$, $m\angle X = 39°$, $z = 30$ m, $x = 28$ m

2 POSSIBLE $\triangle$s



$h = 30 \sin 39 = 18.9$

$m\angle Y = 98.6$

$\frac{\sin 98.6}{y} = \frac{\sin 39}{28}$

$y = \frac{28 \sin 98.6}{\sin 39}$

$y = 44.0$

$m\angle Z = 42.4°$

$m\angle Y = 98.6$

$m\angle Z = 180 - 42.4$

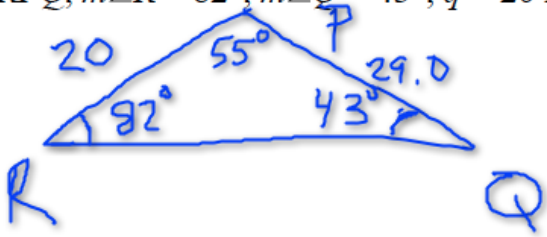
$m\angle Z = 137.6°$

$m\angle Y = 3.4°$

$y = 2.6$

OR

11) In $\triangle RPQ$, $m\angle R = 82°$, $m\angle Q = 43°$, $q = 20$ km



$\frac{\sin 82}{r} = \frac{\sin 43}{20}$

$r = \frac{20 \sin 82}{\sin 43}$

$m\angle P = 180 - (82 + 43)$

$m\angle P = 55°$

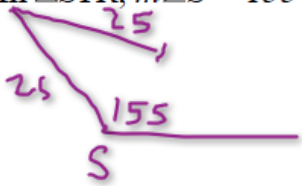
$\frac{\sin 43}{20} = \frac{\sin 55}{p}$

$p = \frac{20 \sin 55}{\sin 43}$

$p = 24.0$

$r \approx 29.0$ $p = 24.0$ $m\angle P = 55°$

12) In $\triangle STR$, $m\angle S = 155°$, $r = 25$ mi, $s = 25$ mi



0 POSSIBLE $\triangle$s

s is too short!