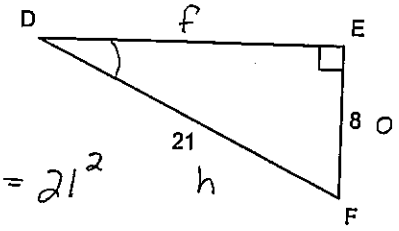
Math 10C
Trig Review

Name: _____

1. Solve the following triangles for all missing sides and angles.



$f^2 + 8^2 = 21^2$

$f^2 + 64 = 441$

$-64 \quad -64$

$f^2 = 377$

$f = \sqrt{377}$

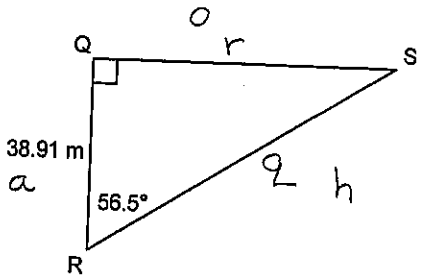
$f = 19.4$

$\sin\theta = \frac{o}{h}$

$\sin\angle D = \frac{8}{21}$

$\angle D = 22°$

$\angle F = 180° - (90° + 22°) = 68°$



$\angle S = 180° - (90° + 56.5°) = 33.5°$

$\cos\theta = \frac{a}{h}$

$\cos 56.5° = \frac{38.91}{q}$

$q = \frac{38.91}{\cos 56.5}$

$q = 70.5$

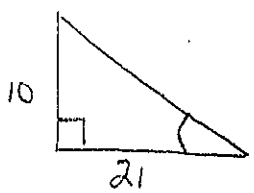
$\tan\theta = \frac{o}{a}$

$\tan 56.5° = \frac{r}{38.91}$

$r = 38.91 \times \tan 56.5°$

$r = 588$

2. A guy wire is attached to a tower at a point that is 10 m above the ground. The wire is anchored 21 m from the base of the tower. What angle, to the nearest degree, does the guy wire make with the ground?

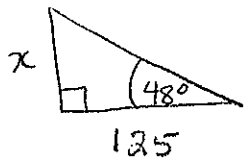


$\tan\theta = \frac{o}{a}$

$\tan\theta = \frac{10}{21}$

$\angle = 25°$

3. A helicopter is ascending vertically. On the ground, a searchlight is 125 m from the point where the helicopter lifted off the ground. It shines on the helicopter and the angle the beam makes with the ground is 48°. How high is the helicopter at this point, to the nearest metre?



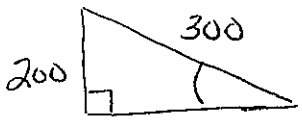
$\tan\theta = \frac{o}{a}$

$\tan 48^\circ = \frac{x}{125}$

$x = 125 \times \tan 48^\circ$

$x = 139\text{m}$

4. A helicopter is hovering 200 m above a road. A car stopped on the side of the road is 300 m from the helicopter. What is the angle of elevation of the helicopter measured from the car, to the nearest degree?

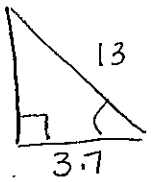


$\sin\theta = \frac{o}{h}$

$\sin\theta = \frac{200}{300}$

$\angle = 42^\circ$

5. A ladder is 13.0 m long. It leans against a wall. The base of the ladder is 3.7 m from the wall. What is the angle of inclination of the ladder to the nearest tenth of a degree?

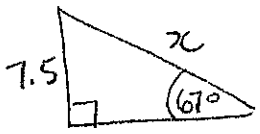


$\cos\theta = \frac{a}{h}$

$\cos\theta = \frac{3.7}{13}$

$\angle = 73.5^\circ$

6. A guy wire is attached to a tower at a point that is 7.5 m above the ground. The angle of inclination of the wire is 67°. Determine the length of the wire to the nearest tenth of a metre.



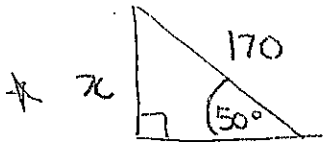
$\sin\theta = \frac{o}{h}$

$\sin 67^\circ = \frac{7.5}{x}$

$x = \frac{7.5}{\sin 67^\circ}$

$x = 8.1\text{m}$

7. A balloon is flying at the end of a 170-m length of string, which is anchored to the ground. The angle of inclination of the string is 50°. Calculate the height of the balloon to the nearest metre.



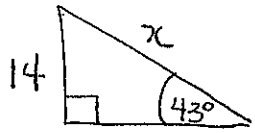
$\sin\theta = \frac{o}{h}$

$\sin 50^\circ = \frac{x}{170}$

$x = 170 \times \sin 50^\circ$

$x = 130\text{m}$

8. A tree broke 14 ft. above the ground. The top of the tree now touches the level ground and the trunk is still partially attached to the stump. The angle of inclination of the tree is 43°. To the nearest foot, determine the height of the tree before it broke.



$\sin\theta = \frac{o}{h}$

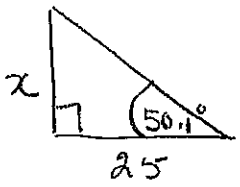
$\sin 43^\circ = \frac{14}{x}$

$x = \frac{14}{\sin 43^\circ}$

$x = 20.5$

$20.5 + 14 = 34.5\text{ft}$

9. At a point 25 ft. from the base of a totem pole, the angle of elevation of the top of the pole is 50.1°. How tall is the totem pole to the nearest foot?



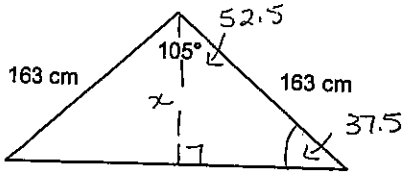
$\tan\theta = \frac{o}{a}$

$\tan 50.1^\circ = \frac{x}{25}$

$x = 25 \times \tan 50.1^\circ$

$x = 30\text{ ft}$

10. The front of a tent has the shape of an isosceles triangle with equal sides 163 cm long. The measure of the angle at the peak of the tent is 105°. Calculate the maximum headroom in the tent to the nearest centimetre.



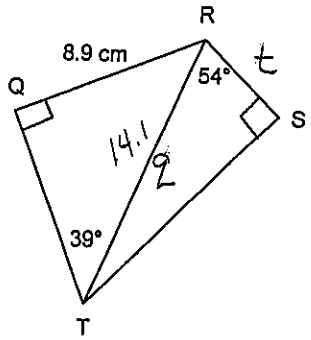
$\cos\theta = \frac{a}{h}$

$\cos 52.5^\circ = \frac{a}{163}$

$a = 163 \times \cos 52.5^\circ$

$a = 99\text{cm}$

11. Determine the length of RS to the nearest tenth of a centimetre.



$\sin\theta = \frac{o}{h}$

$\sin 39^\circ = \frac{8.9}{q}$

$q = \frac{8.9}{\sin 39^\circ}$

$q = 14.1\text{ cm}$

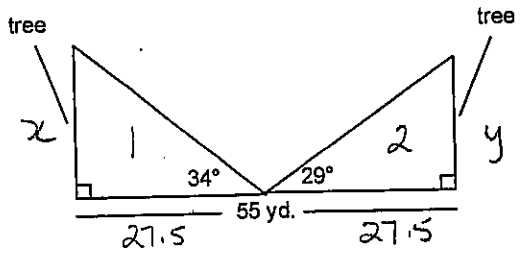
$\cos\theta = \frac{a}{h}$

$\cos 54^\circ = \frac{t}{14.1}$

$t = 14.1 \times \cos 54^\circ$

$t = 8.3\text{ cm}$

12. Two trees are 55 yd. apart. From a point halfway between the trees, the angles of elevation of the tops of the trees are measured. What is the height of each tree to the nearest yard?



(1) $\tan\theta = \frac{o}{a}$ $\quad x = 27.5 \times \tan 34°$

$\tan 34° = \frac{x}{27.5}$ $\quad x = 19\text{yd}$

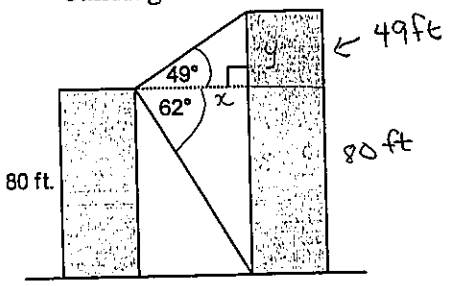
(2) $\tan\theta = \frac{o}{a}$

$\tan 29° = \frac{y}{27.5}$

$y = 27.5 \times \tan 29°$

$\boxed{y = 15\text{yd}}$

13. From the top of an 80-ft. building, the angle of elevation of the top of a taller building is 49° and the angle of depression of the base of this building is 62°. Determine the height of the taller building to the nearest foot.



(1) $\tan\theta = \frac{o}{a}$ $\quad x = \frac{80}{\tan 62°}$

$\tan 62° = \frac{80}{x}$ $\quad x = 42.5$

(2) $\tan\theta = \frac{o}{a}$

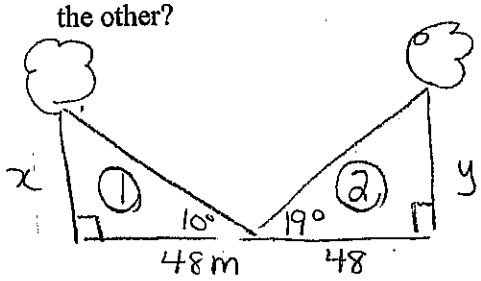
$\tan 49° = \frac{y}{42.5}$

$y = 42.5 \times \tan 49°$

$y = 49$ ft

$49 + 80 = \boxed{129\text{ ft}}$

14. Two trees are 96 m apart. From a point halfway between the trees, the angles of elevation of the tops of the trees are 10° and 19°. To the nearest tenth of a metre, how much taller is one tree than the other?



96m

(1) $\tan\theta = \frac{o}{a}$ $\quad \tan 10° = \frac{x}{48}$

$x = 48 \times \tan 10°$ $\quad x = 8.5$

(2) $\tan\theta = \frac{o}{a}$

$\tan 19° = \frac{y}{48}$

$y = 48 \times \tan 19°$

$y = 16.5$

$16.5 - 8.5 = \boxed{8\text{ ft}}$