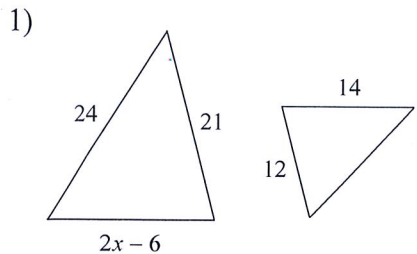


Similar Triangles & Trigonometry

Solve for x . The polygons in each pair are similar.

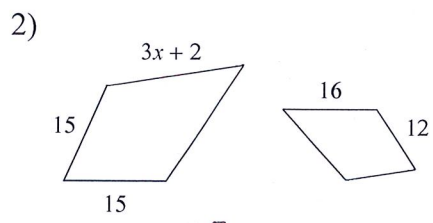


$$\frac{14}{21} = \frac{12}{2x-6}$$

$$252 = 28x - 84$$

$$336 = 28x$$

$$\boxed{12 = x}$$



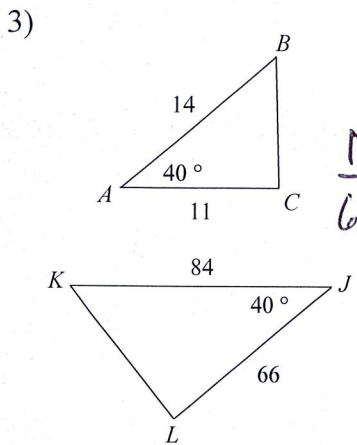
$$\frac{12}{15} = \frac{16}{3x+2}$$

$$240 = 36x + 24$$

$$216 = 36x$$

$$\boxed{6 = x}$$

State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.



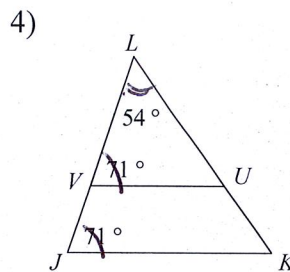
Handwritten work for problem 3:

$$\frac{14}{11} = \frac{84}{66}$$

$$14 \cdot 66 = 11 \cdot 84$$

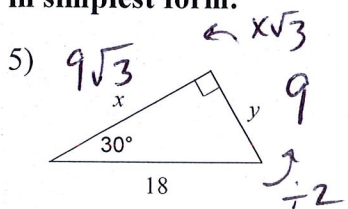
$$924 = 924 \quad \checkmark$$

$\triangle JKL \sim \triangle ABC$
by SAS



$\triangle LKJ \sim \triangle LUV$
by AA

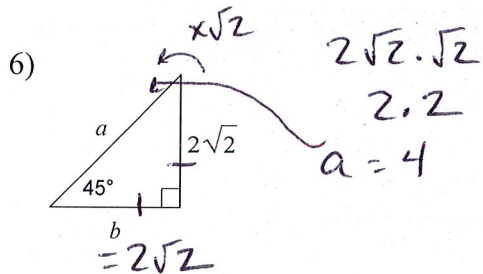
These are special right triangles. Find the missing side lengths. Leave your answers as radicals in simplest form.



Handwritten work for problem 5:

$$x = 9\sqrt{3}$$

$$y = 9$$



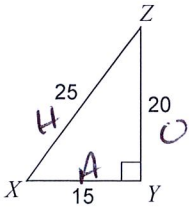
Handwritten work for problem 6:

$$a = 4$$

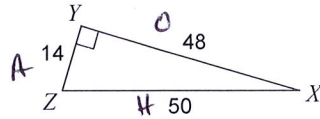
$$b = 2\sqrt{2}$$

Find the value of each trigonometric ratio. Your answers should be simplified fractions.

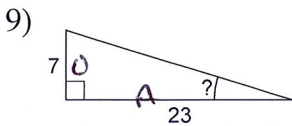
7) $\tan X = \frac{20}{15} = \frac{4}{3}$



8) $\tan Z = \frac{48}{14} = \frac{24}{7}$



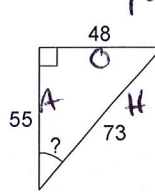
Find the measure of the indicated angle to the nearest tenth of a degree.



$\tan \theta = \frac{7}{23}$
 $\tan^{-1}(\frac{7}{23}) = \theta$

$16.9^\circ \approx \theta$

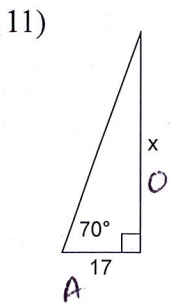
10) You can use any trig function



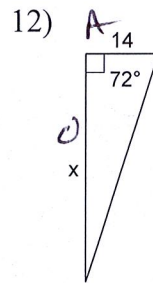
$\sin \theta = \frac{48}{73}$
 $\sin^{-1}(\frac{48}{73}) = \theta$

$41.1^\circ \approx \theta$

Find the missing side. Round to the nearest tenth.

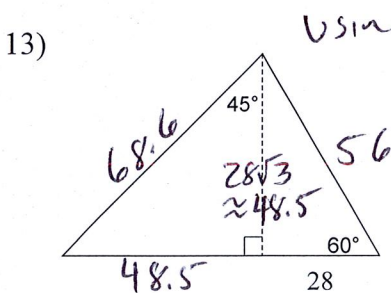


$\tan(70) = \frac{x}{17}$
 $17 \cdot \tan(70) = x$
 $46.7 \approx x$



$\tan(72) = \frac{x}{14}$
 $14 \tan(72) = x$
 $43.1 \approx x$

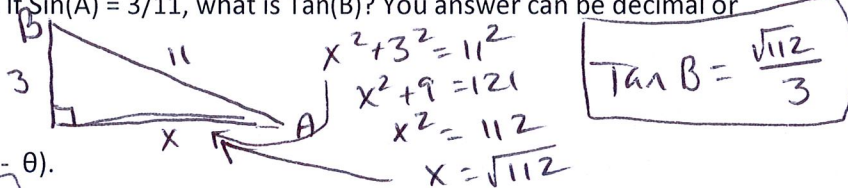
Find the area & perimeter of the triangle. Round intermediate values to the nearest tenth. Use the rounded values to calculate the next value. Round your final answer to the nearest tenth.



$A = \frac{1}{2}(28 + 48.5)(48.5)$
 $= \frac{1}{2}(76.5)(48.5)$
 ≈ 1855.1

$P = 56 + 28 + 48.5 + 68.6$
 ≈ 201.1

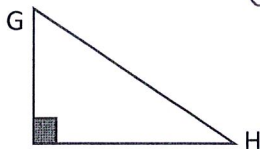
16. A & B are complementary. If $\sin(A) = 3/11$, what is $\tan(B)$? Your answer can be decimal or fraction.



17. If $\cos(\theta) = 7/8$, find $\sin(90 - \theta)$.

$7/8$

- 18.



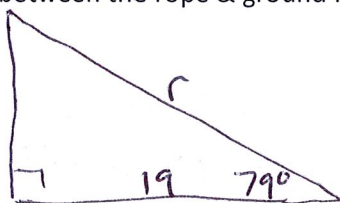
A) What trig function is equivalent to $\sin(G)$

$\cos H$

B) If $\tan(G) = 3/11$, then $\tan(H) =$

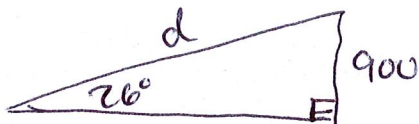
$11/3$

19. Sally is sitting 19ft from a wall and holding a rope that's attached to the top of the wall. The angle of elevation between the rope & ground is 79° . How long is the rope?



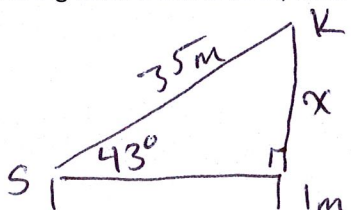
$\cos 79 = \frac{19}{r}$
 $r = \frac{19}{\cos(79)} \approx 99.6 \text{ ft}$

20. A certain airplane is capable of a steady 26° climb. When the jet is 900ft in altitude, how many feet has it travelled through the air (diagonally)?



$\sin(26) = \frac{900}{d}$
 $d = \frac{900}{\sin(26)} \approx 2053.1 \text{ ft}$

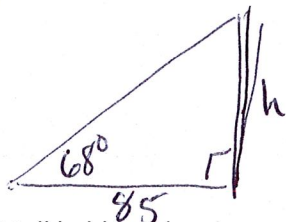
21. Sally is flying a kite at an angle of elevation of 43° . Her hands are 1m above the ground. If 35m of string have been let out, how high is the kite?



$\sin(43) = \frac{x}{35}$
 $35 \sin(43) = x$
 $23.9 \approx x + 1 \text{ m}$

$24.9 = h$

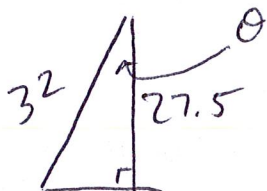
22. When the sun is 68° above the horizon, a pole casts a shadow that's 85in long. How tall is the pole?



$\tan 68 = \frac{h}{85}$

$85 \tan(68) = h$
 $210.4 \text{ m} = h$

23. A 32ft tall ladder is leaning against a wall. If the ladder contacts the wall at a point 27.5ft above ground, what's the measure of the angle between the ladder and wall?

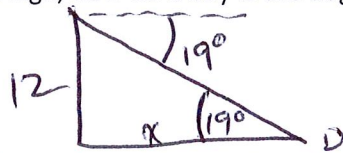


$\cos \theta = \frac{27.5}{32}$

$\theta \approx 30.8^\circ$

$\cos^{-1}\left(\frac{27.5}{32}\right) = \theta$

24. Sally's brother is in a tree house looking down. At a 19° angle of depression, he sees a dog. If the treehouse is 12ft high, how far away is the dog from the base of the tree?



$$\tan 19 = \frac{12}{x}$$

$$x \approx 34.9 \text{ ft}$$

$$x = \frac{12}{\tan(19)}$$

25. Find the angle of elevation of the sun if a 120ft tall cellphone tower is casting a shadow that's 195ft long.

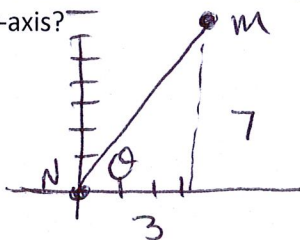


$$\tan \theta = \frac{120}{195}$$

$$\tan^{-1}\left(\frac{120}{195}\right) = \theta$$

$$31.6^\circ \approx \theta$$

26. Point M is at (3, 7). Point N is at the origin (0, 0). What's the measure of the angle formed by \overline{MN} and the x-axis?

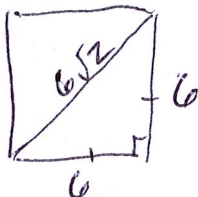


$$\tan \theta = \frac{7}{3}$$

$$\tan^{-1}\left(\frac{7}{3}\right) = \theta$$

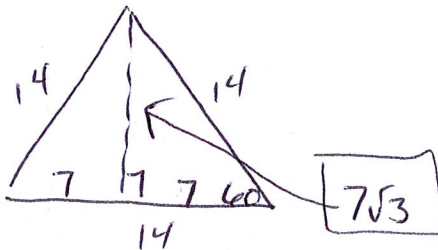
$$66.8^\circ \approx \theta$$

27. If the diagonal of a certain square is $6\sqrt{2}$, what's the area of the square?



$$A = 6 \times 6 = 36$$

28. The perimeter of a certain equilateral Δ is 42. What's the exact length of the altitude of the triangle?



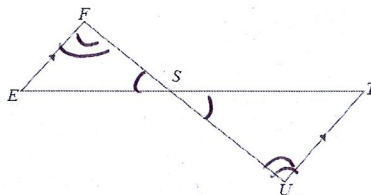
$$P = \frac{42}{3} \quad S = 14$$

$$7\sqrt{3}$$

29. Given: $\overline{EF} \parallel \overline{TU}$

Parallel

Prove: $\Delta EFS \cong \Delta TUS$



Should say Similar

① $\overline{EF} \parallel \overline{TU}$	① given
② $\angle FSE \cong \angle TSU$	② vert. \angle s
③ $\angle F \cong \angle U$	③ Alt Int \angle s
④ $\Delta EFS \cong \Delta TUS$	④ AA (2, 3)