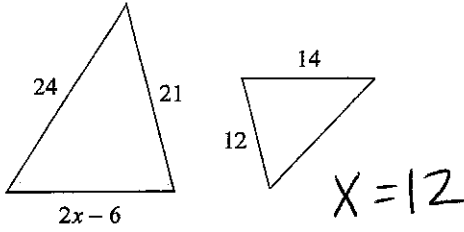


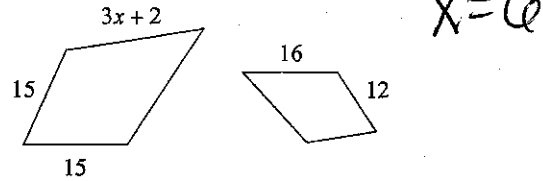
Similar Triangles & Trigonometry

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

1)

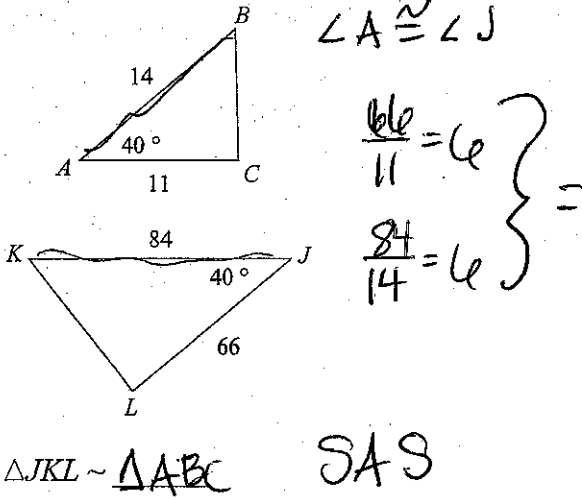


2)

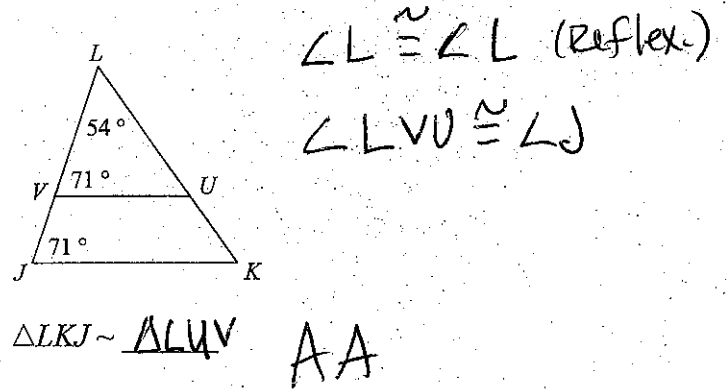


State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

3)

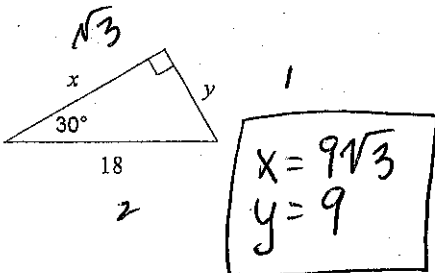


4)

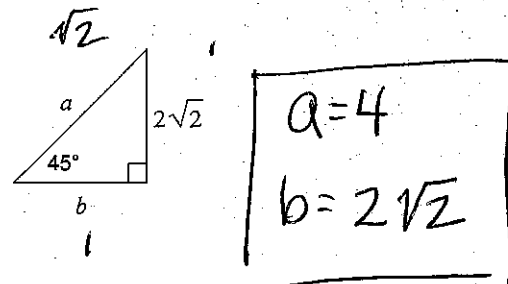


These are special right triangles. Find the missing side lengths. Leave your answers as radicals in simplest form.

5)

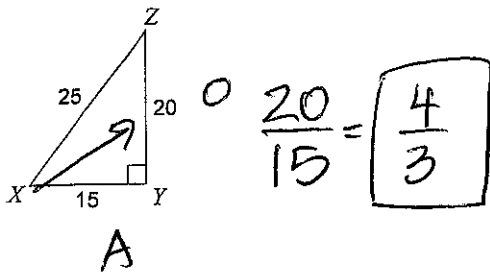


6)

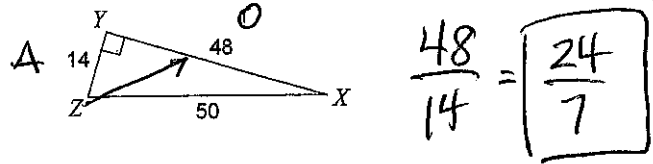


Find the value of each trigonometric ratio. Your answers should be simplified fractions.

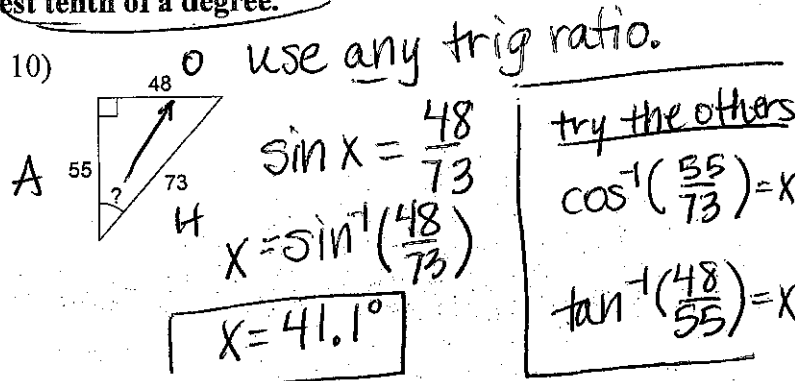
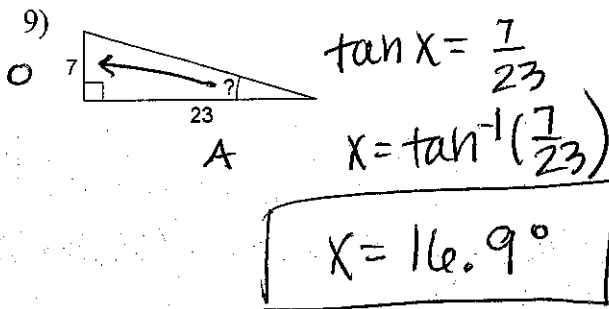
7) $\tan X$



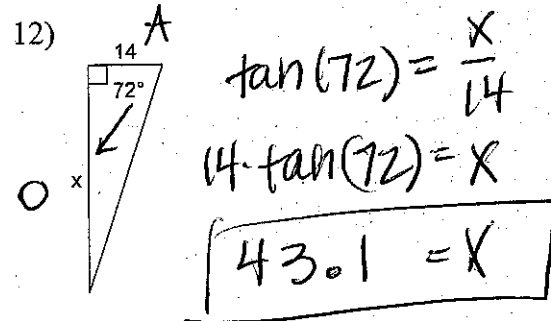
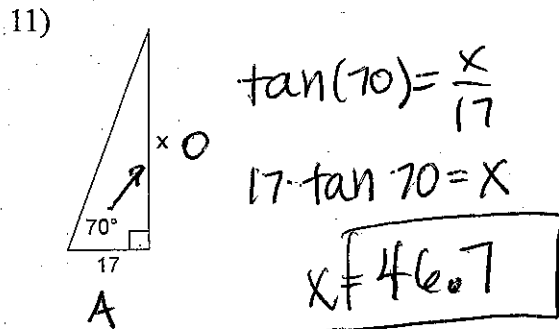
8) $\tan Z$



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

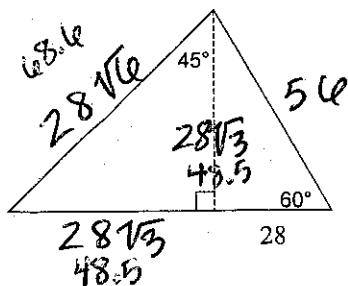


Find the missing side. Round to the nearest tenth.



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. *end.*

13)



Area

$$A = \frac{1}{2} b \cdot h$$

$$= \frac{1}{2} (28\sqrt{3} + 28) \cdot 28\sqrt{3}$$

$$= 1854.9639 \approx 1855.0$$

Perimeter

$$P = 56 + 28 + 28\sqrt{3} + 28\sqrt{3}$$

$$= 201.0831 \approx 201.1$$

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

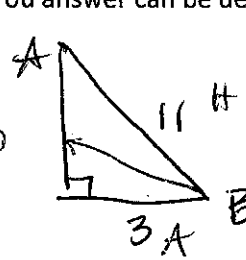
$$1855.1$$

$$P = 56 + 28 + 48.5 + 68.6$$

$$201.1$$

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

$$\tan B = \frac{4\sqrt{7}}{3} \text{ or } \frac{10.583}{3}$$



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 3^2 + x^2 &= 11^2 \\ x &= \sqrt{11^2 - 3^2} \\ x &= 4\sqrt{7} \\ x &= 10.583 \end{aligned}$$

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

$$\frac{7}{8}$$

$$3.5277$$

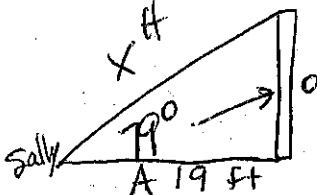
18. G) A) What trig function is equivalent to $\sin(G)$?

$$\cos H$$

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

$$\frac{11}{3}$$

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?

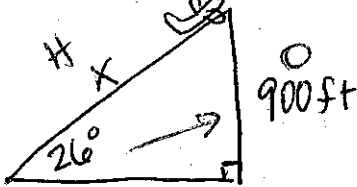


$$\begin{aligned} \cos(79) &= \frac{19}{x} \\ x &= \frac{19}{\cos 79} \end{aligned}$$

$$x = 99.5760$$

$$99.6 \text{ ft}$$

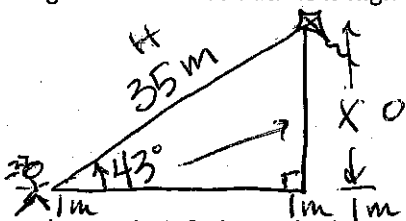
20. A certain airplane is capable of a steady 26° climb. When the jet is 900ft in altitude, how many feet has it travelled through the air (diagonally)?



$$\begin{aligned} \sin(26) &= \frac{900}{x} \\ x &= \frac{900}{\sin 26} \\ x &= 2053.0548 \end{aligned}$$

$$2053.1 \text{ ft}$$

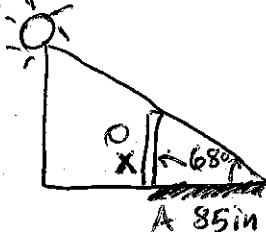
21. Sally is flying a kite at an angle of elevation of 43° . Her hands are 1m above the ground. If 35m of string have been let out. how high is the kite?



$$\begin{aligned} \sin(43) &= \frac{x}{35} \\ 35 \sin(43) &= x \\ 23.8699 &= x \end{aligned}$$

$$\begin{aligned} \text{height} &= 23.9 + 1 \text{ m} \\ &= 24.9 \text{ m} \end{aligned}$$

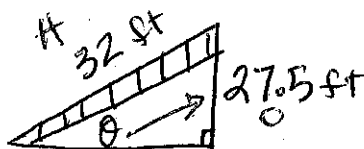
22. When the sun is 68° above the horizon, a pole casts a shadow that's 85in long. How tall is the pole?



$$\begin{aligned} \tan 68 &= \frac{x}{85} \\ 85 \tan 68 &= x \\ 210.382 &= x \end{aligned}$$

$$210.4 \text{ in}$$

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?



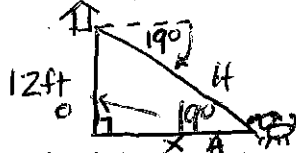
$$\begin{aligned} \sin \theta &= \frac{27.5}{32} \\ \theta &= \sin^{-1}\left(\frac{27.5}{32}\right) \\ \theta &= 59.2465^\circ \end{aligned}$$

$$90 - 59.2465^\circ$$

$$30.8^\circ$$

$$\cos^{-1}\left(\frac{27.5}{32}\right) = 30.8535^\circ$$

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?

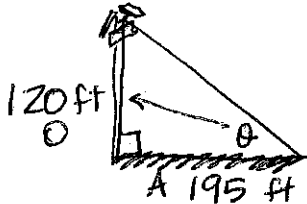


$$\tan 19 = \frac{12}{x}$$

$$\boxed{34.9 \text{ ft}}$$

$$x = \frac{12}{\tan 19} = 34.8505$$

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



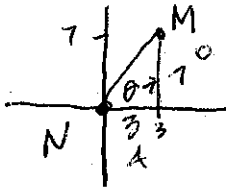
$$\tan \theta = \frac{120}{195}$$

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

$$\boxed{31.6^\circ}$$

$$\theta = 31.6075$$

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?



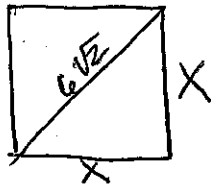
$$\tan \theta = \frac{7}{3}$$

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

$$\boxed{66.8^\circ}$$

$$\theta = 66.8014$$

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



$$x = 6$$

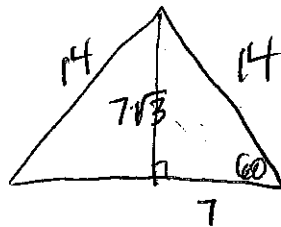
$$A = 6^2 = 36$$

$$\boxed{36}$$

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

$$P = 42$$

$$\text{side} = 14$$



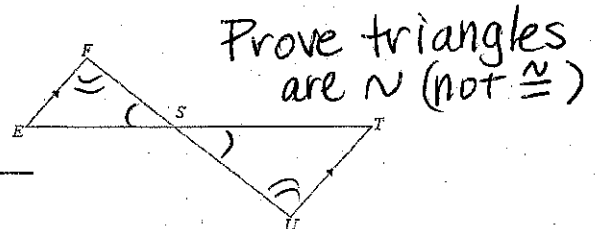
$$\boxed{7\sqrt{3}}$$

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

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

Reasons

- | | |
|---|---------------------------------|
| ① $\overline{EF} \parallel \overline{TU}$ | ① Given |
| ② $\angle F \cong \angle U$ | ② Alt. Int. \angle 's \cong |
| ③ $\angle FSE \cong \angle UST$ | ③ Vert. \angle 's \cong |
| ④ $\Delta EFS \cong \Delta TUS$ | ④ AA \cong |



Prove triangles are \sim (not \cong)