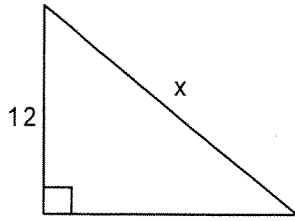


Find the unknown side length. Write your answer in simplest radical form.

1.



$$12^2 + 16^2 = x^2$$

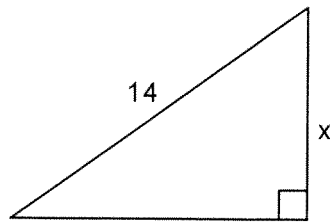
$$144 + 256 = x^2$$

$$400 = x^2$$

$$\sqrt{400} = x$$

$$20 = x$$

2.



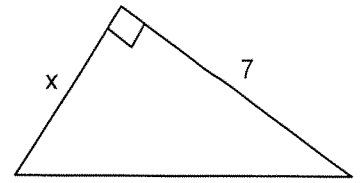
$$11^2 + x^2 = 14^2$$

$$121 + x^2 = 196$$

$$x^2 = 75$$

$$x = 5\sqrt{3}$$

3.



$$x^2 + 7^2 = 9^2$$

$$x^2 + 49 = 81$$

$$x^2 = 32$$

$$x = \sqrt{32} = 4\sqrt{2}$$

Classify the triangle formed by the side lengths as **right**, **acute**, or **obtuse**.

4. 4, 5, 6

$$6^2 < 4^2 + 5^2$$

$$36 < 16 + 25$$

$$36 < 41$$

Acute

5. 9, 12, 15

$$15^2 = 12^2 + 9^2$$

$$225 = 144 + 81$$

$$225 = 225$$

Right

6. 11, 13, 23

$$23^2 > 11^2 + 13^2$$

$$529 > 121 + 169$$

$$529 > 290$$

Obtuse

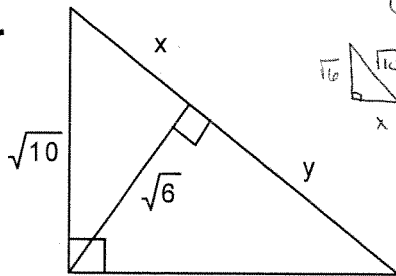
$$c^2 = a^2 + b^2 \quad R$$

$$c^2 < a^2 + b^2 \quad A$$

$$c^2 > a^2 + b^2 \quad O$$

Find the value of each variable. Round each answer to the nearest tenth.

7.



① use P.T. to find x

$$x^2 + (\sqrt{6})^2 = (\sqrt{10})^2$$

$$x^2 + 6 = 10$$

$$x^2 = 4$$

$$x = \sqrt{4}$$

$$x = 2$$

② Find y using Geometric mean

$$\frac{x}{\sqrt{10}} = \frac{\sqrt{10}}{x+y}$$

$$\frac{2}{\sqrt{10}} = \frac{\sqrt{10}}{2+y}$$

$$4 + 2y = 10$$

$$2y = 6$$

$$y = 3$$

③ Find z using Pythag. Theo

$$(\sqrt{10})^2 + z^2 = 5^2$$

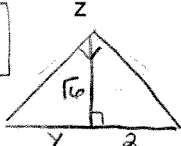
$$10 + z^2 = 25$$

$$z^2 = 15$$

$$z = \sqrt{15}$$

$$z \approx 3.9$$

Other way Finding y



$$\frac{y}{\sqrt{6}} = \frac{\sqrt{6}}{2}$$

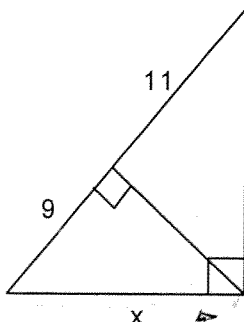
$$2y = 6$$

$$y = 3$$

Alternate method

Find the value of the variable. Round each answer to the nearest tenth.

8.



$$\frac{20}{x} = \frac{x}{9}$$

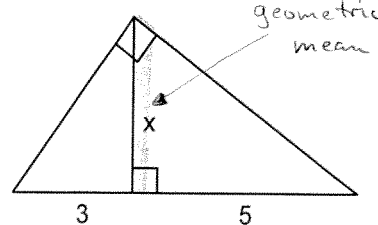
$$x^2 = 180$$

$$x = \sqrt{180}$$

$$x \approx 13.4$$

geometric mean

9.



$$\frac{3}{x} = \frac{x}{5}$$

$$x^2 = 15$$

$$x = \sqrt{15}$$

$$x \approx 3.8$$

geometric mean

— or —

$$(\sqrt{6})^2 + 3^2 = z^2$$

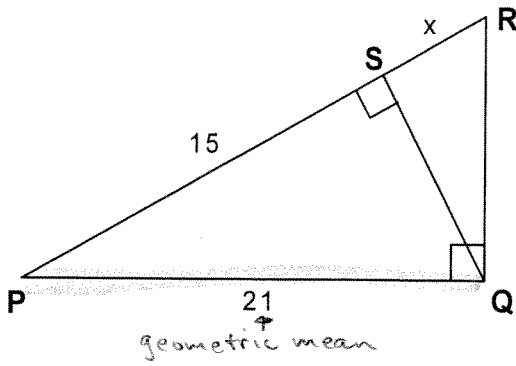
$$6 + 9 = z^2$$

$$15 = z^2$$

$$\sqrt{15} = z$$

$$3.9 \approx z$$

10. Write a similarity statement for the three similar triangles in the diagram. Then solve for x.



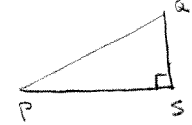
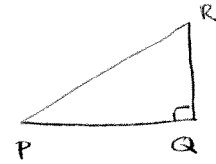
$\Delta PQR \sim \Delta PSQ \sim \Delta QSR$

$$\frac{15}{21} = \frac{21}{15+x}$$

$$441 = 225 + 15x$$

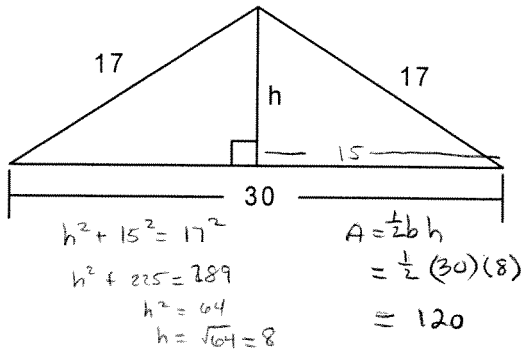
$$216 = 15x$$

$$14.4 \approx x$$

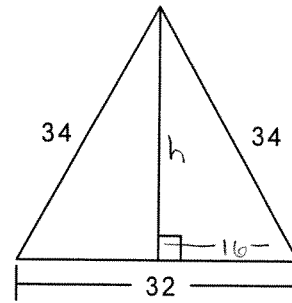


Find the area of the isosceles triangle. Find Height using Pythagorean Theorem!

11.



12.



$$16^2 + h^2 = 34^2$$

$$256 + h^2 = 1156$$

$$h^2 = 900$$

$$h = \sqrt{900} = 30$$

$$A = \frac{1}{2}bh$$

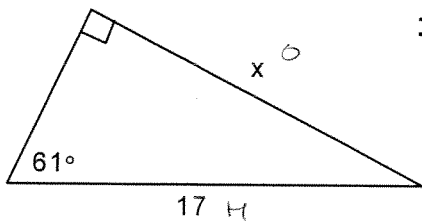
$$= \frac{1}{2}(32)(30)$$

$$= 480$$

Use the trig ratios to find the value of x. Round to the nearest tenth.

SOH CAH TOA

13.

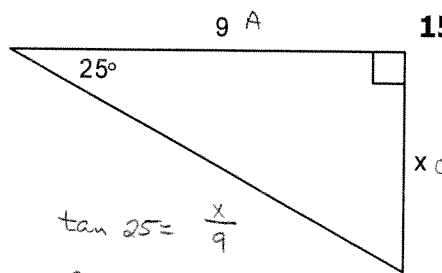


$$\sin 61 = \frac{x}{17}$$

$$17 \sin 61 = x$$

$$14.9 \approx x$$

14.

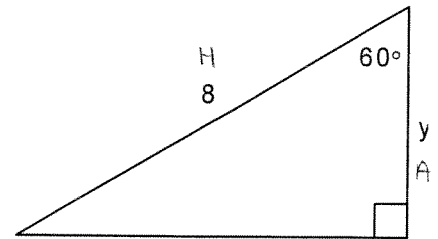


$$\tan 25 = \frac{x}{9}$$

$$9 \tan 25 = x$$

$$4.2 \approx x$$

15.



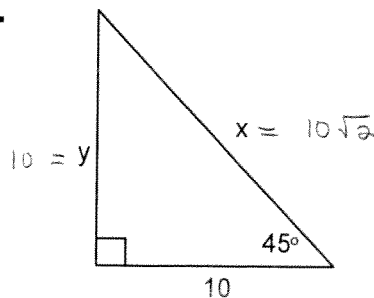
$$\cos 60 = \frac{8}{H}$$

$$8 \cos 60 = y$$

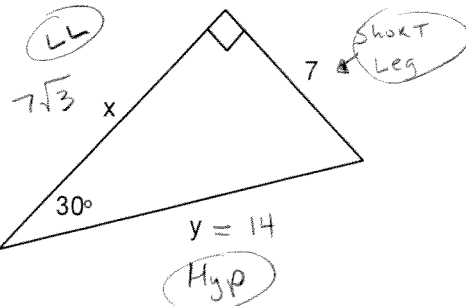
$$4.0 = y$$

Find the value of each variable using special right triangles. Leave answers in simplest radical form.

16.

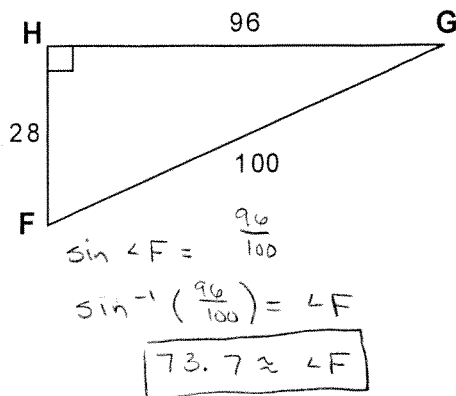


17.



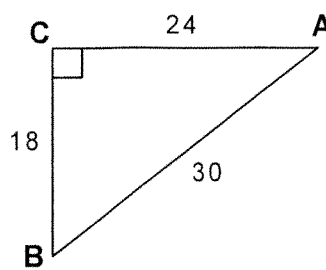
45-45-90
 30-60-90
 ↓
 Special Right Δ's

18. Find the value of $\angle F$ and $\angle G$.



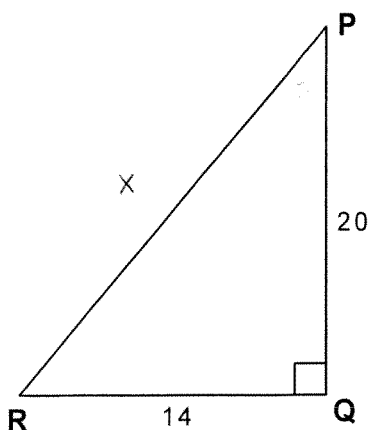
$\angle G = 180 - 90 - \angle F$
 $\angle G \approx 16.3$

19. Find the value of $\angle A$ and $\angle B$.



$\tan \angle B = \frac{24}{18}$
 $\tan^{-1}\left(\frac{24}{18}\right) = \angle B$
 $53.1^\circ \approx \angle B$
 $\angle A \approx 36.9^\circ$

20. Solve the right triangle. (find EVERYTHING!) Round answers to the nearest tenth.

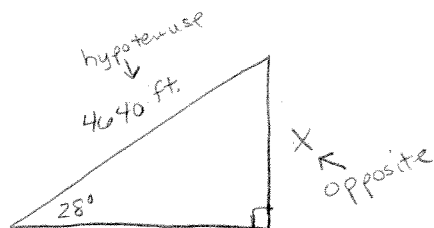


$\angle R$ Let $x = RP$
 $14^2 + 20^2 = x^2$
 $196 + 400 = x^2$
 $596 = x^2$
 $\sqrt{596} = x$
 $24.4 \approx x$
 $RP \approx 24.4$

$\angle R$
 $\tan \angle R = \frac{20}{14}$
 $\tan^{-1}\left(\frac{20}{14}\right) = \angle R$
 $55.0^\circ \approx \angle R$

$\angle P$
 $180 - 90 - \angle R$
 $m\angle P \approx 35.0^\circ$

21. A chair lift on a ski slope has an angle of elevation of 28° and covers a total distance of 4640 feet. To the nearest foot, what is the **vertical** height of the chair lift?



$\sin = \frac{\text{opp}}{\text{hyp.}}$

$\frac{SOH}{\uparrow \uparrow}$

$\sin 28 = \frac{x}{4640}$

$4640 \sin 28 = x$

$2178.34 \approx x$

Be sure to write a sentence!

The vertical height of the chair lift is about 2,178 feet.