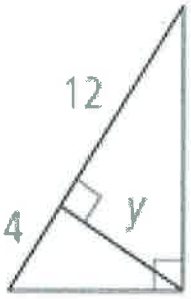
Geometry H
Section 7.3 – 7.4 Quiz Review

Name : Key
Date : _____ Period : ___

Solve for the indicated variables. Write your answers in simplest radical form when necessary.

1.



$\frac{4}{x} = \frac{x}{16}$

$x^2 = 64$

$\boxed{x = 8}$

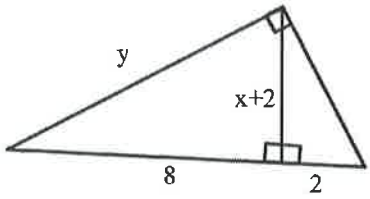
$\frac{4}{y} = \frac{y}{12}$

$y^2 = 48$

$y = \sqrt{48}$

$\boxed{y = 4\sqrt{3}}$

2.



$\frac{8}{x+2} = \frac{x+2}{2}$

$16 = (x+2)(x+2)$

$16 = x^2 + 4x + 4$

$0 = x^2 + 4x - 12$

$0 = (x+6)(x-2)$

$x \neq -6$, $\boxed{x = 2}$

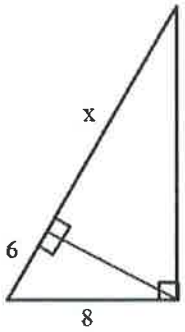
$\frac{8}{y} = \frac{y}{10}$

$y^2 = 80$

$y = \sqrt{80}$

$\boxed{y = 4\sqrt{5}}$

3.



$\frac{6}{8} = \frac{8}{6+x}$

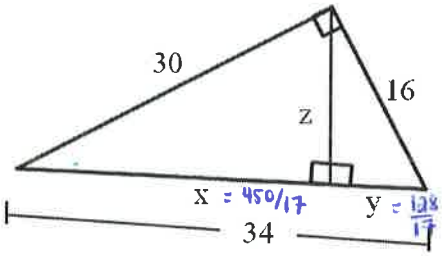
$64 = 6(6+x)$

$64 = 36 + 6x$

$28 = 6x$

$x = \frac{28}{6} = \boxed{\frac{14}{3}}$

4.



$\frac{x}{30} = \frac{30}{34}$

$34x = 900$

$x = \frac{900}{34} = \boxed{\frac{450}{17}}$

$\frac{450}{17} + y = 34$

$y = \frac{34}{1} - \frac{450}{17}$

$y = \frac{578}{17} - \frac{450}{17}$

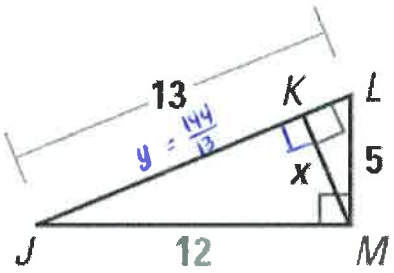
$\boxed{y = \frac{128}{17}}$

$\frac{\frac{450}{17}}{z} = \frac{z}{\frac{128}{17}}$

$z^2 = \left(\frac{450}{17}\right)\left(\frac{128}{17}\right)$

$z^2 = \frac{57600}{289} \Rightarrow z = \frac{\sqrt{57600}}{\sqrt{289}} = \boxed{\frac{240}{17}}$

5.



$\frac{y}{12} = \frac{12}{13}$

$144 = 13y$

$y = \frac{144}{13}$

$x^2 + \left(\frac{144}{13}\right)^2 = 12^2$

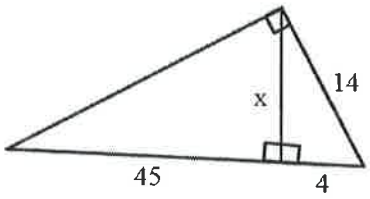
$x^2 + \frac{20736}{169} = 144$

$x^2 = \frac{144}{1} - \frac{20736}{169}$

$x^2 = \frac{24336}{169} - \frac{20736}{169}$

$x^2 = \frac{3600}{169} \Rightarrow \boxed{x = \frac{60}{13}}$

6.



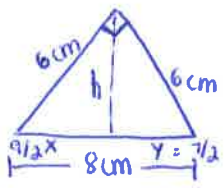
$\frac{45}{x} = \frac{x}{4}$

$x^2 = 180$

$x = \sqrt{180}$

$\boxed{x = 6\sqrt{5}}$

7. The legs of an isosceles triangle are each 6 cm. The length of the base is 8 cm. Find the length of the altitude to the base. Round to the nearest hundredth.



Right

$\frac{x}{6} = \frac{6}{8}$

$36 = 8x$

$x = \frac{36}{8}$

$x = \frac{9}{2}$

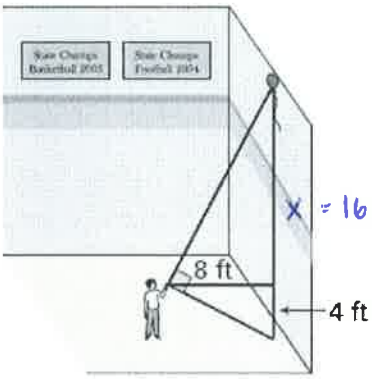
$\frac{\frac{9}{2}}{h} = \frac{h}{\frac{7}{2}}$

$h^2 = \left(\frac{9}{2}\right)\left(\frac{7}{2}\right)$

$h^2 = \frac{63}{4}$

$h = \frac{\sqrt{63}}{\sqrt{4}} \Rightarrow \boxed{h \approx 3.97}$

8. A balloon rises to the ceiling of a gymnasium. You want to find the distance from the ground to the balloon. You use a cardboard square to line up the balloon and the ground. Your friend measures the vertical distance from the ground to your eye and the distance from you to the gym wall. Approximate the distance from the ground to the balloon.



$\frac{4}{8} = \frac{8}{x}$

$64 = 4x$

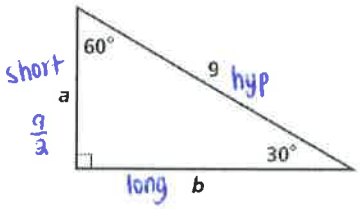
$x = 16$

The distance from ground → balloon = 4 + 16

= 20 ft

Find the value of each variable. Leave your answers in simplest radical form.

9.



hyp = short · 2

$9 = a \cdot 2$

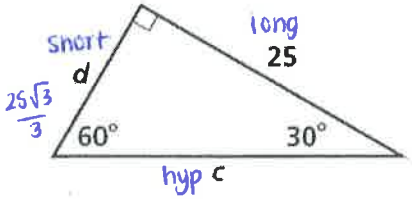
$a = \frac{9}{2}$

long = short $\sqrt{3}$

$b = \frac{9}{2} \cdot \frac{\sqrt{3}}{1}$

$b = \frac{9\sqrt{3}}{2}$

10.



long = short · $\sqrt{3}$

$25 = d \cdot \sqrt{3}$

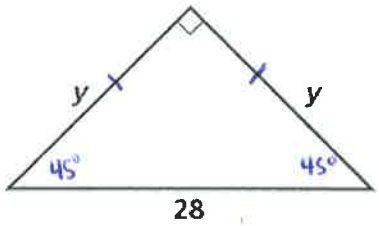
$d = \frac{25}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{25\sqrt{3}}{3}$

hyp = short · 2

$c = \frac{25\sqrt{3}}{3} \cdot \frac{2}{1}$

$c = \frac{50\sqrt{3}}{3}$

11.



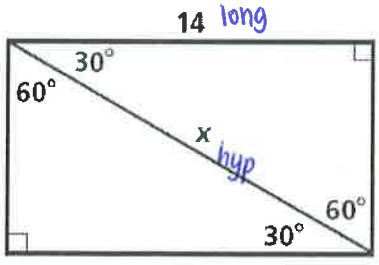
hyp = leg · $\sqrt{2}$

$28 = y\sqrt{2}$

$y = \frac{28}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{28\sqrt{2}}{2} = 14\sqrt{2}$

$y = 14\sqrt{2}$

12.



$y = \frac{14\sqrt{3}}{3}$ short

long = short · $\sqrt{3}$

$14 = y\sqrt{3}$

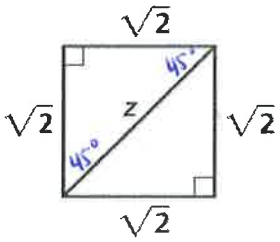
$y = \frac{14}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{14\sqrt{3}}{3}$

hyp = short · 2

$x = \frac{14\sqrt{3}}{3} \cdot \frac{2}{1}$

$x = \frac{28\sqrt{3}}{3}$

13.



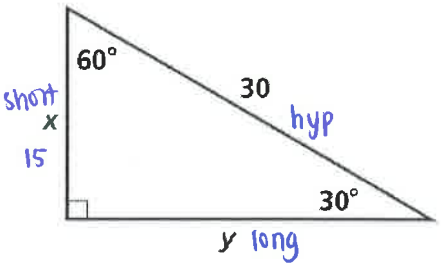
hyp = leg · $\sqrt{2}$

$z = \sqrt{2}\sqrt{2}$

$z = \sqrt{4}$

$z = 2$

14.



hyp = short · 2

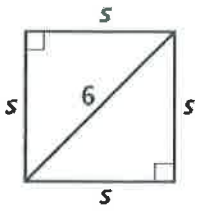
$30 = x \cdot 2$

$x = 15$

long = short · $\sqrt{3}$

$y = 15\sqrt{3}$

15.

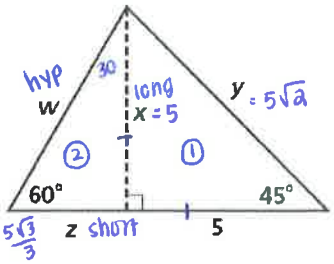


hyp = leg · √2

6 = s · √2

$s = \frac{6 \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{6\sqrt{2}}{2} =$ **$3\sqrt{2} = s$**

16.



Triangle ①:

hyp = leg · √2

$y = 5\sqrt{2}$

legs are ≅ so

$x = 5$

Triangle ②

long = short · √3

$5 = z \cdot \sqrt{3}$

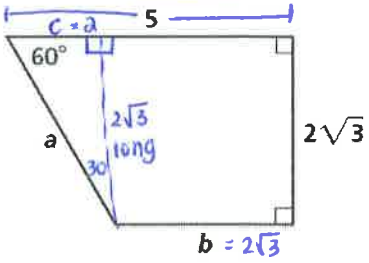
$z = \frac{5 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} =$ **$\frac{5\sqrt{3}}{3} = z$**

hyp = short · 2

$w = \frac{5\sqrt{3}}{3} \cdot \frac{2}{1} =$ **$\frac{10\sqrt{3}}{3} = w$**

17.

$b = 2\sqrt{3}$



long = short · √3

$\frac{2\sqrt{3}}{\sqrt{3}} = \frac{c\sqrt{3}}{\sqrt{3}}$

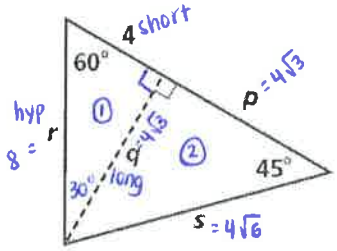
$c = 2$

hyp = short · 2

$a = 2 \cdot 2$

$a = 4$

18.



Triangle ①:

hyp = short · 2

$r = 4 \cdot 2$

$r = 8$

long = short · √3

$q = 4\sqrt{3}$

Triangle ②

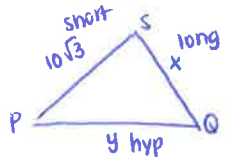
Legs are ≅ so **$p = 4\sqrt{3}$**

hyp = leg · √2

$s = 4\sqrt{3}\sqrt{2}$

$s = 4\sqrt{6}$

19. Find the perimeter of ΔPQR. Write your answer in simplest radical form.



hyp = short · 2

$y = 10\sqrt{3} \cdot 2$

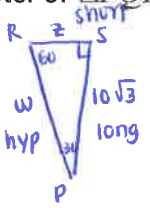
$y = 20\sqrt{3}$

long = short · √3

$x = 10\sqrt{3}\sqrt{3}$

$x = 10(3)$

$x = 30$



long = short · √3

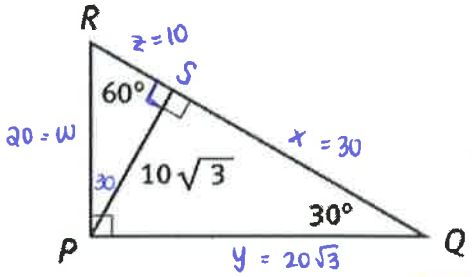
$\frac{10\sqrt{3}}{\sqrt{3}} = \frac{z \cdot \sqrt{3}}{\sqrt{3}}$

$z = 10$

hyp = short · 2

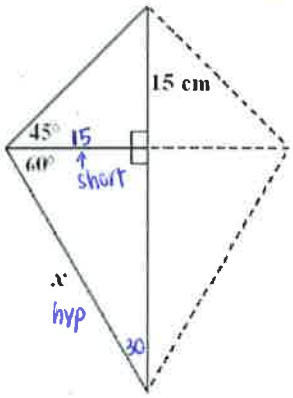
$w = 10 \cdot 2$

$w = 20$



Perimeter = $20 + 10 + 30 + 20\sqrt{3}$ = **$60 + 20\sqrt{3}$ units**

20. A design is formed by joining isosceles right triangles and 30°-60°-90° right triangles as shown in the diagram. If a leg of the isosceles right triangle is 15 cm, what is the length of the hypotenuse of the 30°-60°-90° triangle?

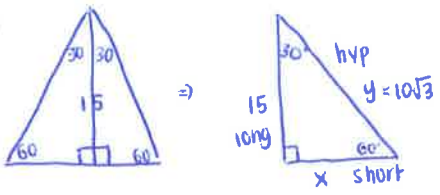


hyp = short · 2

$x = 15 \cdot 2$

$x = 30$ cm

21. The length of the altitude to the base in an equilateral triangle is 15 ft. Find the perimeter of the triangle.



long = short $\sqrt{3}$ hyp = short · 2

$15 = x\sqrt{3}$ $y = \frac{15\sqrt{3}}{3} \cdot \frac{2}{1} = \frac{30\sqrt{3}}{3} = 10\sqrt{3}$

$x = \frac{15}{\sqrt{3}} = \frac{15\sqrt{3}}{3}$

Perimeter = $3(10\sqrt{3}) =$ **$30\sqrt{3}$ ft**

22. A gardener has a square vegetable garden. The length of the garden's diagonal is 25 ft. Sketch a picture of this situation and find the area and the perimeter of the garden. Round your answer to two decimal places.

hyp = leg · $\sqrt{2}$

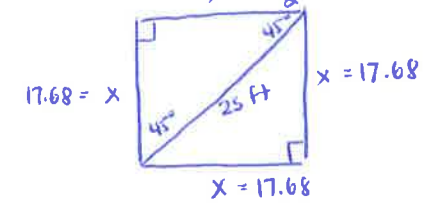
$25 = x\sqrt{2}$

$x = \frac{25}{\sqrt{2}} = \frac{25\sqrt{2}}{2}$

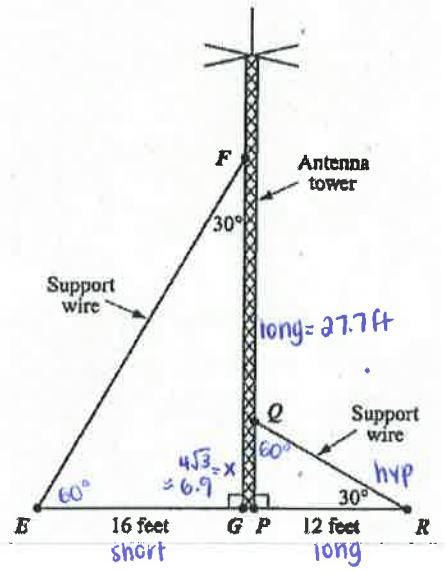
Perimeter = $4(17.68) = 70.72$ ft

Area = $\ell \times w = (17.68)(17.68) = 312.58$ ft^2

$x = \frac{25\sqrt{2}}{2} \approx 17.68$



23. The diagram below shows the placement of two support wires for an antenna tower and some of the dimensions and angle measures resulting from their placement.



a. What is the measure, in degrees, of angle E? **60°**

b. What is the length, in feet, of the support wire of the larger triangle? hyp = short · 2

wire = 16 · 2 = **32 ft**

c. What is the length, in feet, of the height of the antenna tower from point G to point F? long = short · $\sqrt{3}$

height = $16\sqrt{3} \approx$ **27.7 ft**

d. What is the length, in feet, of the support wire of the smaller triangle?

long = short · $\sqrt{3}$

$12 = x\sqrt{3}$

$x = \frac{12 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{12\sqrt{3}}{3} = 4\sqrt{3}$

hyp = short · 2

wire = $4\sqrt{3} \cdot 2$

wire = $8\sqrt{3} \approx$ **13.9 ft**

e. What is the length, in feet, of the height of the antenna tower from point Q to point F?

PQ + QF = PF

6.9 + QF = 27.7 ⇒ **QF = 20.8 ft**

Answers: 1) x=8, y=$4\sqrt{3}$ 2) x=2, y=$4\sqrt{5}$ 3) x=14/3 4) x=450/17, y=128/17, z=240/17 5) x=60/13 6) x=$6\sqrt{5}$ 7) 3.97 cm 8) 20 ft 9) a=9/2, b=$\frac{9\sqrt{3}}{2}$ 10) d=$\frac{25\sqrt{3}}{3}$, c=$\frac{50\sqrt{3}}{3}$ 11) $14\sqrt{2}$ 12) y=$\frac{14\sqrt{3}}{3}$, x=$\frac{28\sqrt{3}}{3}$ 13) 2 14) x=15, y=$15\sqrt{3}$ 15) $3\sqrt{2}$ 16) w=$\frac{10\sqrt{3}}{3}$, x=5, y=$5\sqrt{2}$, z=$\frac{5\sqrt{3}}{3}$ 17) a=4, b=$2\sqrt{3}$ 18) p=$4\sqrt{3}$, q=$4\sqrt{3}$, r=8, s=$4\sqrt{6}$ 19) 60+$20\sqrt{3}$ units 20) 30 cm 21) $30\sqrt{3}$ ft 22) P=70.72 ft, A=313.29 ft^2 23) a. 60° b. 32 ft c. 27.7 ft d. 13.9 ft e. 20.8 ft