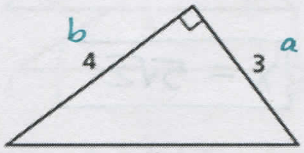
Name Key Date ________________ Pd ______

9.1 - 9.3 Practice Worksheet

9.1 Pythagorean Theorem and Triples

In Exercises 1–3 find the value of *x*. Then tell whether the side lengths form a Pythagorean triple.

1.

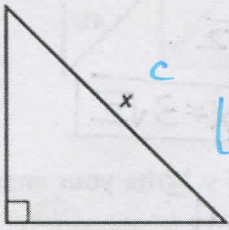


b, a, c

$\boxed{x=5}$
yes

$3^2+4^2=x^2$
$9+16=x^2$
$25=x^2$

2.

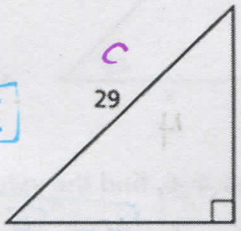


b, c, a

$\boxed{x=7\sqrt{2}}$
no

$7^2+7^2=x^2$
$49+49=x^2$

3.



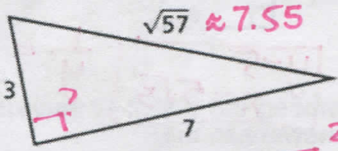
c, b, a

$\boxed{x=21}$
yes

$x^2+20^2=29^2$
$x^2+400=841$
$x^2=441$

In Exercises 7 and 8, tell whether the triangle is a right triangle.

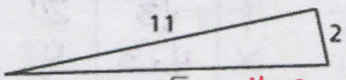
7.



≈ 7.55

$3^2+7^2 \,\_\_\, \sqrt{57}^2$
$9+49 \,\_\_\, 57$
$58>57$
$\boxed{\text{NO; acute}}$

8.



≈ 11.18

$2^2+11^2 \,\_\_\, (5\sqrt{5})^2$
$4+121 \,\_\_\, 125$
$125=125$
$\boxed{\text{yes, right}}$

In Exercises 9–12, verify that the segment lengths form a triangle. Is the triangle *acute, right,* or *obtuse*?

9. 5, 12, and 13 — $5+12>13$ ✓ $5^2+12^2=13^2$ $\boxed{\text{yes, triple}}$

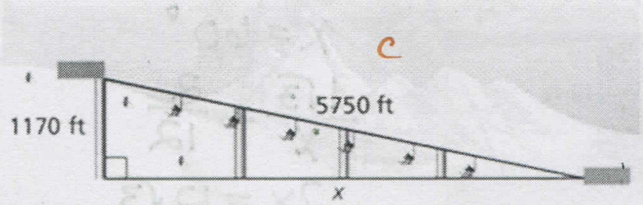
10. 5, 7, and 8 — $5+7>8$ ✓ $5^2+7^2 \,\_\_\, 8^2$; $25+49 \,\_\_\, 64$; $74>64$ $\boxed{\text{yes, acute}}$

11. 2, 10, and 11 — $2+10>11$ ✓ $2^2+10^2 \,\_\_\, 11^2$; $4+100<121$ $\boxed{\text{yes, obtuse}}$

12. $\sqrt{8}$, 4, and 6 — $2.828+4>6$ ✓ $\sqrt{8}^2+4^2 \,\_\_\, 6^2$; $8+16<36$ $\boxed{\text{yes, obtuse}}$

13. A ski lift forms a right triangle, as shown. Use the Pythagorean Theorem (Theorem 9.1) to approximate the horizontal distance traveled by a person riding the ski lift. Round your answer to the nearest whole foot.

$\boxed{\approx 5630 \text{ ft}}$

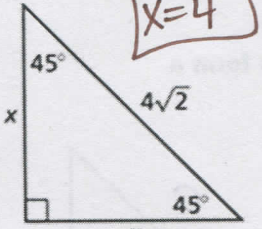


c, a, b

$(1170)^2+x^2=(5750)^2$
$1368900+x^2=33062500$
$x^2=31693600$
$x\approx 5629.707\text{ft}$

9.2 Special Right Triangles

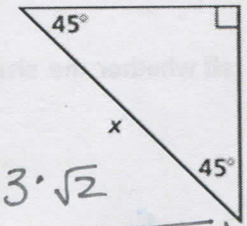
In Exercises 1–3, find the value of x. Write your answer in simplest form.

1. 

$\frac{4\sqrt{2}}{\sqrt{2}}$

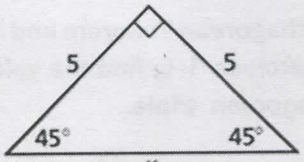
4

$\boxed{x=4}$

2. 

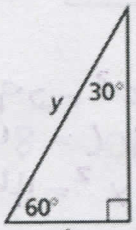
$3\cdot\sqrt{2}$

$\boxed{x=3\sqrt{2}}$

3. 

$\boxed{x=5\sqrt{2}}$

In Exercises 4–6, find the values of x and y. Write your answers in simplest form.

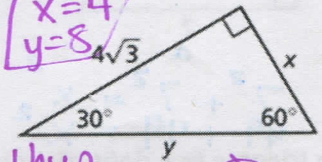
4. 

sl	ll	hyp
1	$\sqrt{3}$	2
1	x	y

$\frac{1}{1}=\frac{\sqrt{3}}{x}$

$\frac{1}{1}=\frac{2}{y}$

$\boxed{x=\sqrt{3},\ y=2}$

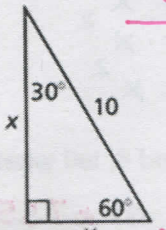
5. 

$\boxed{x=4,\ y=8}$

sl	ll	hyp
1	$\sqrt{3}$	2
x	$4\sqrt{3}$	y

$\frac{1}{x}=\frac{\sqrt{3}}{4\sqrt{3}}$

$\frac{\sqrt{3}}{4\sqrt{3}}=\frac{2}{y}$

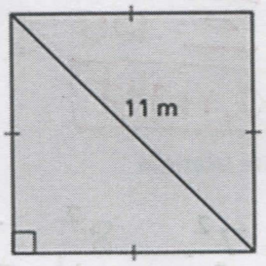
6. 

sl	ll	hyp
1	$\sqrt{3}$	2
y	x	10

$\frac{1}{y}=\frac{2}{10}$ $\quad \frac{\sqrt{3}}{x}=\frac{2}{10}$

$\boxed{y=5,\ x=5\sqrt{3}}$

In Exercises 7 and 8, find the area of the figure. Round decimal answers to the nearest tenth.

7. 

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

$2x^2=121$

$x^2=\frac{121}{2}$

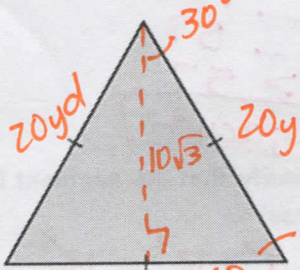
$x=\frac{11}{\sqrt{2}}$

$A=S^2$

$=\left(\frac{11}{\sqrt{2}}\right)^2$

$=\boxed{\frac{121}{2}\ m^2}$

$\boxed{\approx 60.5\ m^2}$

8. 

sl	ll	hyp
1	$\sqrt{3}$	2
y	x	20

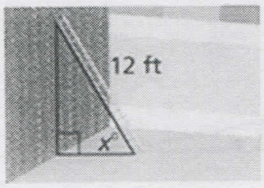
$A=\frac{1}{2}(20)(10\sqrt{3})$

$=10(10\sqrt{3})$

$\boxed{=100\sqrt{3}\ yd^2}$

$\boxed{\approx 173.2\ yd^2}$

9. A 12-foot ladder is leaning up against a wall, as shown. How high does the ladder reach up the wall when x is 30°? 45°? 60°? Round decimal answers to the nearest tenth, if necessary.



$x=30°$

$\frac{12}{2}=\boxed{6\ ft}$

$x=60°$

$\frac{1\sqrt{3}}{x}=\frac{2}{12}$

$2x=12\sqrt{3}$

$\boxed{x=6\sqrt{3}\ ft \approx 10.4\ ft}$

$x=45°$

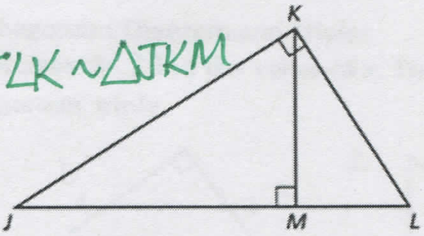
$\frac{12}{\sqrt{2}}\boxed{=6\sqrt{2}\ ft}$

$\approx 8.485\ ft$

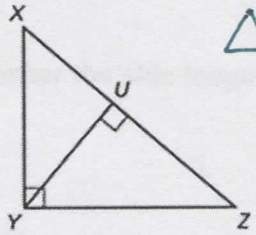
$\boxed{\approx 8.5\ ft}$

9.3 Geometric Mean

In Exercises 1 and 2, identify the similar triangles.

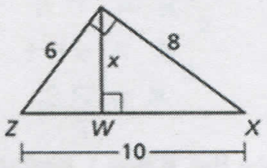
1. 

$\triangle KLM \sim \triangle JLK \sim \triangle JKM$

2. 

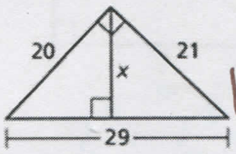
$\triangle YXU \sim \triangle ZXY \sim \triangle ZYU$

In Exercises 3–5, find the value of *x*.

3. 

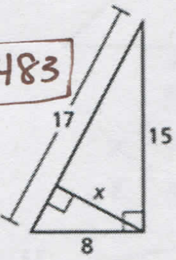
$\frac{6}{x} = \frac{10}{8}$

$\boxed{x = 4.8}$

4. 

$\frac{29}{20} = \frac{21}{x}$

$\boxed{x \approx 14.483}$

5. 

$\frac{17}{8} = \frac{15}{x}$

$\boxed{x \approx 7.059}$

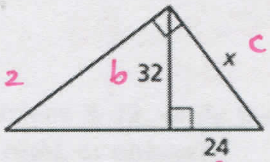
In Exercises 6–8, find the geometric mean of the two numbers.

6. 3 and 12 $\frac{3}{x} = \frac{x}{12}$ $\boxed{x = 6}$

7. 4 and 14 $\frac{4}{x} = \frac{x}{14}$ $\boxed{x = \sqrt{56} = 2\sqrt{14} \approx 7.483}$

8. 10 and 24 $\frac{10}{x} = \frac{x}{24}$ $\boxed{x = \sqrt{240} = 4\sqrt{15} \approx 15.4}$

In Exercises 9–11, find the value of *x*.

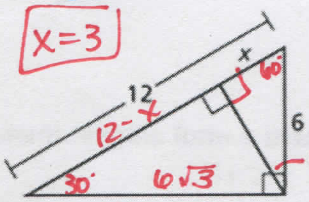
9. 

$24^2 + 32^2 = x^2$

$576 + 1024 = x^2$

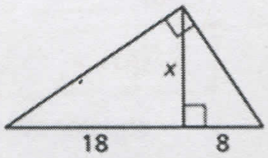
$1600 = x^2$

$\boxed{40 = x}$

10. 

$6^2 + ?^2 = 12^2$

$\boxed{x = 3}$

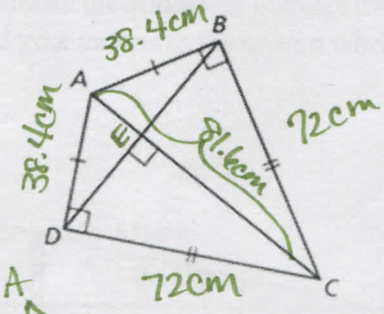
11. 

$\frac{18}{x} = \frac{x}{8}$

$x^2 = 144$

$\boxed{x = 12}$

12. You are designing a diamond-shaped kite. You know that AB = 38.4 centimeters, BC = 72 centimeters, and AC = 81.6 centimeters. You want to use a straight crossbar $\overline{BD}$. About how long should it be?



$\frac{38.4}{81.6} = \frac{x}{72}$

$81.6x = 2764.8$

$x = 33.882$

$= 2(33.882)$

$= 67.765$

$\boxed{BD \approx 67.765 \text{ cm}}$