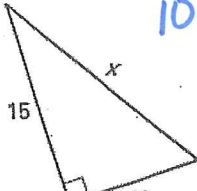
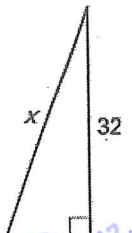


Key

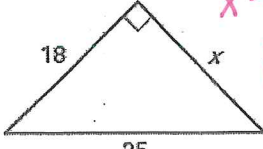
Worksheet 10.1

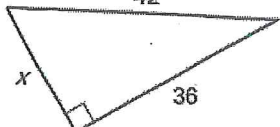
Find the length of the hypotenuse, leave answer in simplest radical form.

1)  $10^2 + 15^2 = x^2$
 $325 = x^2$
 $5\sqrt{13} = x$

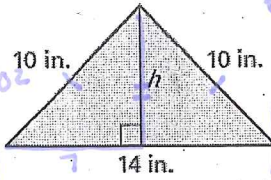
2)  $32^2 + 12^2 = x^2$
 $1168 = x^2$
 $4\sqrt{73} = x$

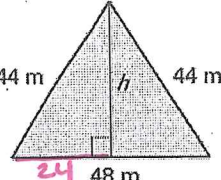
Find the unknown leg length, leave answer in simplest radical form.

3)  $x^2 + 18^2 = 25^2$
 $x^2 = 301$
 $x = \sqrt{301}$

4)  $x^2 + 36^2 = 42^2$
 $x^2 = 460$
 $x = 2\sqrt{115}$

Find the area of the isosceles triangle in simplest radical form.

5)  $h^2 + 7^2 = 10^2$
 $h^2 = 51$
 $h = \sqrt{51}$
 CPCTC alt. cuts base in $\frac{1}{2}$
 $A = \frac{1}{2} b \cdot h$
 $A = \frac{1}{2} (14) (\sqrt{51})$
 $A = 7\sqrt{51} \text{ in}^2$

6)  $A = \frac{1}{2} b \cdot h$
 Find h 1st
 $h^2 + 24^2 = 44^2$
 $h^2 = 1360$
 $h = 4\sqrt{85} \text{ m}$
 $A = \frac{1}{2} (48) (4\sqrt{85})$
 $A = 96\sqrt{85} \text{ m}^2$

The given lengths are two sides of a right triangle. All three side lengths of the triangle are integers and together form a Pythagorean triple. Find the length of the third side and tell whether it is a leg or the hypotenuse. a or b = legs c = hyp.

7) 24 and 32

$C = 40$
hyp.

8) 24 and 45

$C = 51$
hyp.

9) 40 and 85

$a = 75$
leg

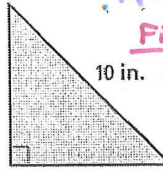
10) 49 and 168

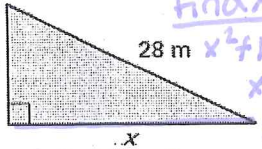
$C = 175$
hyp.

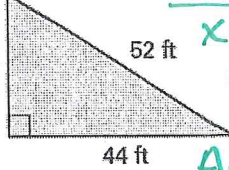
11) 72 and 78

$a = 30$ leg

Find the area of the right triangle. Write your answer in simplest radical form.

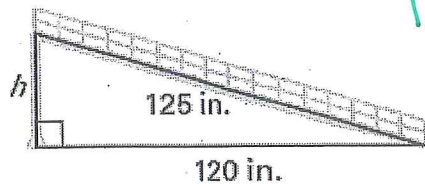
12)  $A = \frac{1}{2} b \cdot h$
 Find x
 $x^2 + 7^2 = 10^2$
 $x = \sqrt{51}$
 $A = \frac{1}{2} (7) (\sqrt{51})$
 $A = \frac{7\sqrt{51}}{2} \text{ in}^2$

13)  $A = \frac{1}{2} b \cdot h$
 Find x 1st
 $x^2 + 12^2 = 28^2$
 $x^2 = 640$
 $x = 8\sqrt{10}$
 $A = \frac{1}{2} (8\sqrt{10}) (12)$
 $A = 48\sqrt{10} \text{ m}^2$

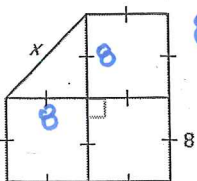
14)  $A = \frac{1}{2} b \cdot h$
 Find x
 $x^2 + 44^2 = 52^2$
 $x^2 = 768$
 $x = 16\sqrt{3}$
 $A = \frac{1}{2} (44) (16\sqrt{3})$
 $A = 352\sqrt{3} \text{ ft}^2$

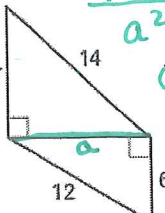
15) A shipping dock has a mobile ramp that is used to help load and unload cargo from trucks. The ram is 125 inches long and has a base that is 120 inches long. What is the height h or the ramp?

$h^2 + 120^2 = 125^2$
 $h^2 = 1225$
 $h = 35 \text{ in}$

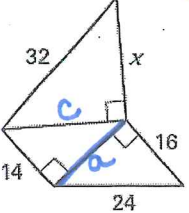


Challenge, Find the value of x for each

16)  $8^2 + 8^2 = x^2$
 $128 = x^2$
 $8\sqrt{2} = x$

17)  $A = \frac{1}{2} b \cdot h$
 Find a 1st
 $a^2 + 6^2 = 12^2$
 $a^2 = 108$
 $a = 6\sqrt{3}$

Find x
 $(6\sqrt{3})^2 + x^2 = 14^2$
 $x^2 = 88$
 $x = 2\sqrt{22}$

18)  $A = \frac{1}{2} b \cdot h$
 Find a 1st
 $a^2 + 16^2 = 24^2$
 $a^2 = 320$
 $a = 8\sqrt{5}$
 $(8\sqrt{5})^2 + 14^2 = c^2$
 $516 = c^2$
 $2\sqrt{129} = c$
 Now find x
 $x^2 + (2\sqrt{129})^2 = 32^2$
 $x^2 = 508$
 $x = 2\sqrt{127}$

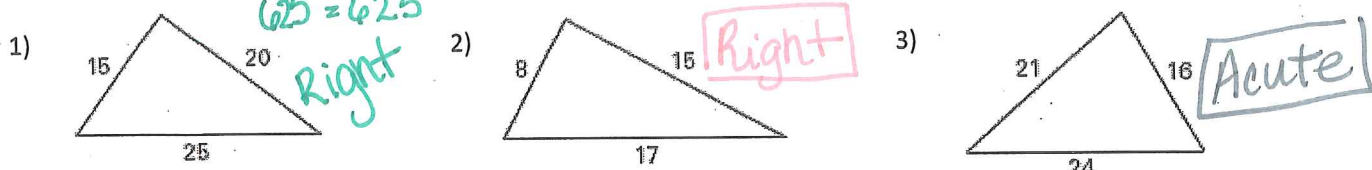
$a^2 + b^2 = c^2$ Right Δ
 $a^2 + b^2 < c^2$ obtuse Δ
 $a^2 + b^2 > c^2$ acute Δ

Key

10.1 Part 2 Converse of Pythagorean Theorem

Name _____

Tell whether the triangle is a right triangle. If not a right triangle, then what kind?

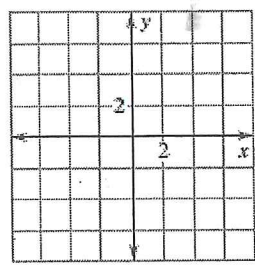


Decide whether the numbers can represent the side lengths of a triangle. If they can, classify the triangle as acute, right, or obtuse.

- 4) 6, 8, 10 **Right**
 5) 5, 7, 9 **Obtuse**
 6) 8, 9, 10 **Acute**
 7) 10, 12, 30 **None** (10+12 must be greater than 30)
 8) 16, 30, 34 **Right**
 9) 18, 34, 45 **Obtuse**
 10) $\sqrt{8}, 4, 6$ **Obtuse** ($24 < 36$)
 11) 20, 21, 28 **Acute**
 12) $\sqrt{13}, 10, 12$ **Obtuse**
 13) 14, 48, 50 **Right** ($2500 = 2500$)

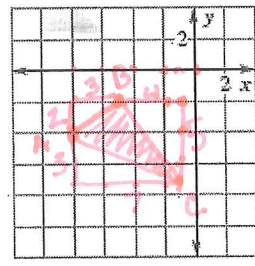
Graph points A, B, and C. Connect the points to form ΔABC . Decide whether ΔABC is right, acute, or obtuse.

- 14) $A(-3, 5), B(0, -2), C(4, 1)$



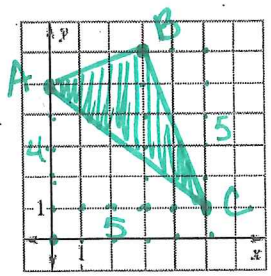
Acute - must show 3 distances and sum of squares

- 15) $A(-8, -4), B(-5, -2), C(-1, -7)$



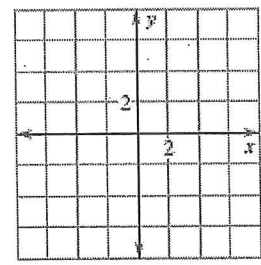
$2^2 + 3^2 = AB^2$
 $4^2 + 5^2 = BC^2$
 $3^2 + 7^2 = AC^2$
Obtuse

- 16) $A(0, 5), B(3, 6), C(5, 1)$



Find distances
 $1^2 + 3^2 = AB^2$
 $\sqrt{10} = AB$
 $4^2 + 5^2 = AC^2$
 $\sqrt{41} = AC$
 $2^2 + 5^2 = BC^2$
 $\sqrt{29} = BC$
 Does $AB^2 + BC^2 = AC^2$?
 $10 + 29 = 41$
Obtuse

- 17) $A(-2, 4), B(2, 0), C(5, 2)$



Obtuse - must show 3 distances and sum of squares.

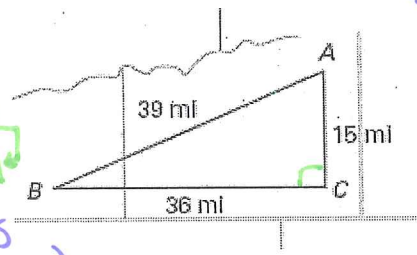
The sides and classification of a triangle are given below. The length of the longest side is the integer given. What value(s) of x make the triangle?

- 20) x, x, 8; **right** $x^2 + x^2 = 8^2$ $x = 4\sqrt{2}$
 21) x, x, 12; **obtuse** $x^2 < 72$ $x < 6\sqrt{2}$
 22) x, x, 6; **acute** $x^2 + x^2 > 6^2$ $x > 3\sqrt{2}$
 23) x, x, 16; **right** $x^2 + x^2 = 16^2$ $x = 8\sqrt{2}$
 24) x, x, 10; **obtuse** $x^2 + x^2 < 10^2$ $x < 5\sqrt{2}$
 25) x, x, 15; **acute** $x^2 + x^2 > 15^2$ $x > 7.5\sqrt{2}$

Maps The distances between three towns are given in the diagram.

- 26) Is the triangle (ΔABC) formed by the three towns a right triangle?

Yes, $a^2 + b^2 = c^2$
 $36^2 + 15^2 = 1521$
 $39^2 = 1521$



- 27) Town B is directly west of town C. Is town A directly north of town C?
 Yes, because it is a Right Δ (from #26)