Name_____ Date_____

7.3 – The Pythagorean Theorem

Find the square root(s).

1) $\pm\sqrt{121}$ $= \pm 11$

2) $-\sqrt{0.49}$ $= -0.7$

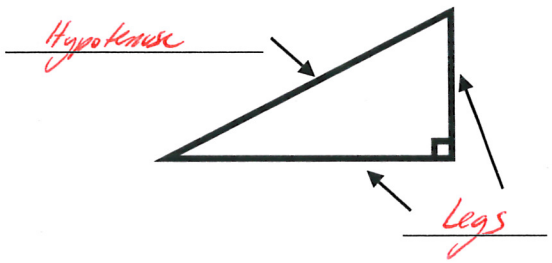
3) $\sqrt{\frac{16}{25}}$ $= \frac{4}{5}$

4) $\sqrt{441}$ $= 21$

5) $\pm\sqrt{225}$ ± 15

6) $\pm\sqrt{256}$ ± 16

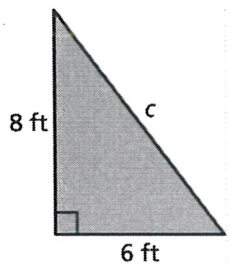
7) Label the parts:



8) If it is a right triangle, then the formula of the Pythagorean theorem, $a^2+b^2=c^2$, works.

Find the missing length of the triangle. Show all algebraic work.

8)



$a^2+b^2=c^2$

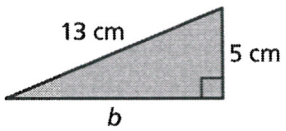
$6^2+8^2=c^2$

$36+64=c^2$

$\sqrt{100}=\sqrt{c^2}$

$10=c$

9)



$a^2+b^2=c^2$

$5^2+b^2=13^2$

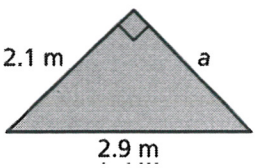
$25+b^2=169$

$-25 \quad -25$

$\sqrt{b^2}=\sqrt{144}$

$b=12\text{ cm}$

10)



$a^2+b^2=c^2$

$a^2+2.1^2=2.9^2$

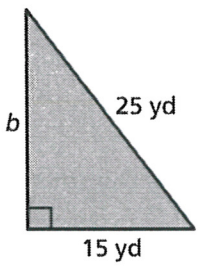
$a^2+4.41=8.41$

$-4.41 \quad -4.41$

$\sqrt{a^2}=\sqrt{4}$

$a=2\text{m}$

11)



$a^2+b^2=c^2$

$15^2+b^2=25^2$

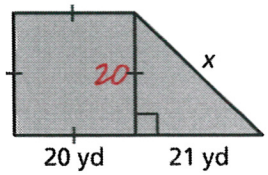
$225+b^2=625$

$-225 \quad -225$

$\sqrt{b^2}=\sqrt{400}$

$b=20\text{yd}$

12) Find the missing length of the figure.



$a^2 + b^2 = c^2$

$20^2 + 21^2 = x^2$

$400 + 441 = x^2$

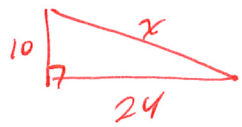
$\sqrt{841} = \sqrt{x^2}$

$29\text{ yd} = x$

13) Can a right triangle have a leg that is 10 meters long and a hypotenuse that is 10 meters long? Show work and explain.

No. The hypotenuse has to be longer than the legs.

14) You built braces in the shape of a right triangle to hold your surfboard. The leg (brace) attached to the wall is 10 inches and your surfboard sits on a leg that is 24 inches. What is the length of the hypotenuse that completes the right triangle?



$a^2 + b^2 = c^2$

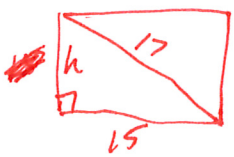
$10^2 + 24^2 = x^2$

$100 + 576 = x^2$

$\sqrt{676} = \sqrt{x^2}$

$26\text{ in} = x$

15) Laptops are advertised by the lengths of the diagonals of the screen. You purchase a 17-inch laptop and the width of the screen is 15 inches. What is the height of its screen?



$a^2 + b^2 = c^2$

$h^2 + 15^2 = 17^2$

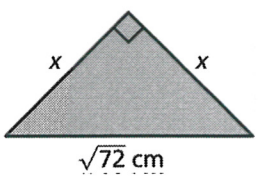
$h^2 + 225 = 289$

$-225 \quad -225$

$\sqrt{h^2} = \sqrt{64}$

$h = 8\text{ in}$

16) In a right isosceles triangle, the lengths of both legs are equal. For the given isosceles triangle, what is the value of x?



$a^2 + b^2 = c^2$

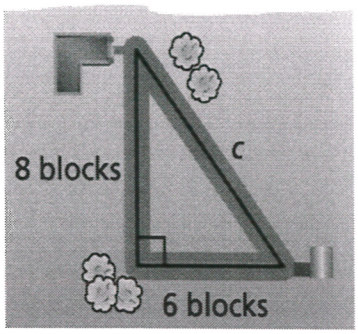
$x^2 + x^2 = (\sqrt{72})^2$

$\frac{2x^2}{2} = \frac{72}{2}$

$x^2 = 36$

$x = 6\text{ cm}$

17) To get from your house to your school, you ride your bicycle 6 blocks west and 8 blocks north. A new road is being built that will go directly from your house to your school, creating a right triangle. When you take the new road to school, how many fewer blocks will you be riding to school and back?



$a^2 + b^2 = c^2$

$6^2 + 8^2 = c^2$

$36 + 64 = c^2$

$\sqrt{100} = \sqrt{c^2}$

10 blocks = c

18) Find the missing length of the right triangle if its dimensions are: $a=3,\ b=\sqrt{27},\ c=?$

$a^2 + b^2 = c^2$

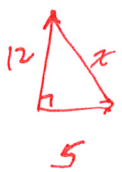
$3^2 + (\sqrt{27})^2 = c^2$

$9 + 27 = c^2$

$\sqrt{36} = \sqrt{c^2}$

6 = c

19) Peter and Paul are standing together talking. When they leave, Peter walks 5 kilometers east to his house and Paul walk 12 kilometers north to his house. How many kilometers do they live from each other if you take the direct rout? *(Hint: It may help to draw a picture).*



$a^2 + b^2 = c^2$

$5^2 + 12^2 = x^2$

$25 + 144 = x^2$

$\sqrt{169} = \sqrt{x^2}$

13 km = x

20) Name a way that someone could use the Pythagorean Theorem to solve a "real life" problem.

Answers will vary