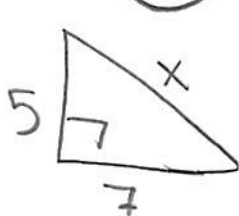


Homework #1

- 1) The lengths of the legs of a right triangle are 5 and 7. The length of the hypotenuse is

- A) 12  
 B)  $\sqrt{74}$   
 C)  $2\sqrt{3}$   
 D)  $\sqrt{35}$



$$5^2 + 7^2 = x^2$$

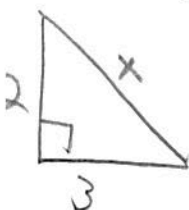
$$25 + 49 = x^2$$

$$\sqrt{74} = \sqrt{x^2}$$

$x = \sqrt{74}$

- 2) If the lengths of the legs of a right triangle are 2 and 3, then the length of its hypotenuse is

- A) 5  
 B)  $\sqrt{5}$   
 C)  $\sqrt{13}$   
 D) 4



$$2^2 + 3^2 = x^2$$

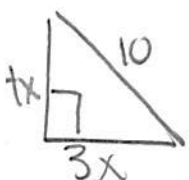
$$4 + 9 = x^2$$

$$\sqrt{13} = \sqrt{x^2}$$

$x = \sqrt{13}$

- 3) The legs of a right triangle are in the ratio 3:4. If the hypotenuse is 10, what is the length of the longer leg?

- A) 3  
 B) 8  
 C) 6  
 D) 4



$$(4x)^2 + (3x)^2 = 10^2$$

$$16x^2 + 9x^2 = 100$$

$$\frac{25x^2}{25} = \frac{100}{25}$$

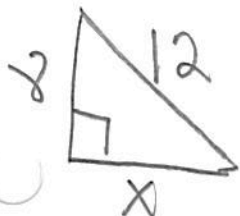
$$x^2 = 4$$

$$x = 2$$

$x = 2$

- 4) In a right triangle, the length of the hypotenuse is 12 and the length of one leg is 8. What is the length of the other leg?

- A)  $\sqrt{80}$   
 B) 4  
 C)  $\sqrt{208}$   
 D)  $\sqrt{20}$



$$8^2 + x^2 = 12^2$$

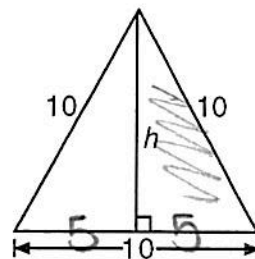
$$64 + x^2 = 144$$

$$\frac{x^2}{1} = \frac{80}{1}$$

$$\sqrt{x^2} = \sqrt{80}$$

$x = \sqrt{80}$

- 5) In the accompanying diagram, the length of each side of the equilateral triangle is 10.



What is the length of altitude  $h$ ?

- A)  $5\sqrt{2}$   
 B) 5  
 C)  $5\sqrt{3}$   
 D)  $10\sqrt{3}$

$$5^2 + h^2 = 10^2$$

$$25 + h^2 = 100$$

$$\frac{h^2}{1} = \frac{75}{1}$$

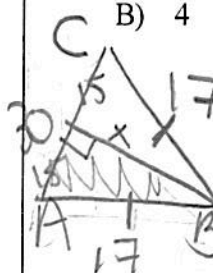
$$h = \sqrt{75}$$

$$h = \sqrt{75} = \sqrt{25 \cdot 3}$$

$= 5\sqrt{3}$

- 6) In  $\triangle ABC$ ,  $\overline{AB} \cong \overline{BC}$ ,  $AB = 17$ , and  $AC = 30$ . The length of the altitude to  $\overline{AC}$  is

- A) 17  
 B) 4  
 C) 15  
 D) 8



$$15^2 + x^2 = 17^2$$

$$225 + x^2 = 289$$

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

$x = 8$

- 7) What is the length of the altitude of an equilateral triangle whose side has length 4?

- A)  $4\sqrt{3}$   
 B) 4  
 C) 2  
 D)  $2\sqrt{3}$



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

$$x^2 + 4 = 16$$

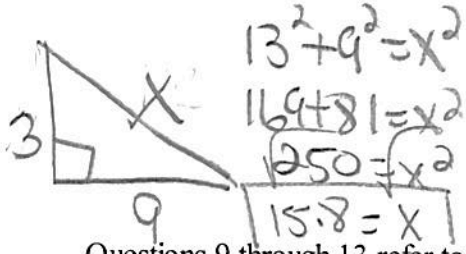
$$\frac{x^2}{1} = \frac{12}{1}$$

$$\sqrt{x^2} = \sqrt{12}$$

$x = \sqrt{12}$

$\sqrt{12} = \sqrt{4 \cdot 3}$   
 $= 2\sqrt{3}$

- 8) A wire reaches from the top of a 13-meter telephone pole to a point on the ground 9 meters from the base of the pole. What is the length of the wire to the nearest tenth of a meter?
- A) 15.6  
 B) 16.2  
 C) 15.8  
 D) 16.0



$$13^2 + 9^2 = X^2$$

$$169 + 81 = X^2$$

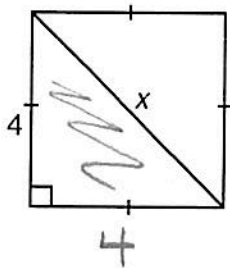
$$250 = X^2$$

$$15.8 = X$$

Questions 9 through 13 refer to the following:

Use the information marked on the figure to find the value of  $x$ .

9)



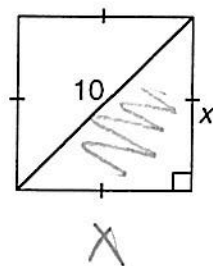
$$4^2 + 4^2 = x^2$$

$$16 + 16 = x^2$$

$$32 = x^2$$

$$\sqrt{32} = x$$

10)



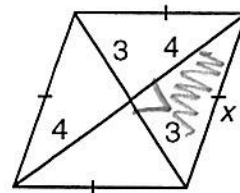
$$x^2 + x^2 = 10^2$$

$$\frac{2x^2}{2} = \frac{100}{2}$$

$$\sqrt{x^2} = \sqrt{50}$$

$$x = \sqrt{50}$$

11)



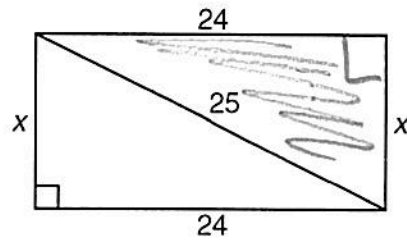
$$4^2 + 3^2 = x^2$$

$$16 + 9 = x^2$$

$$25 = x^2$$

$$5 = x$$

12)



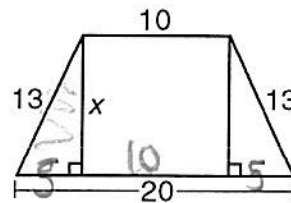
$$24^2 + x^2 = 25^2$$

$$576 + x^2 = 625$$

$$\begin{array}{r} 576 \\ -576 \\ \hline x^2 = 49 \end{array}$$

$$x = 7$$

13)



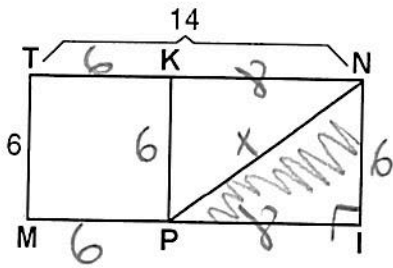
$$5^2 + x^2 = 13^2$$

$$25 + x^2 = 169$$

$$x^2 = 144$$

$$x = 12$$

- 14) In the accompanying diagram, MINT is a rectangle and MPKT is a square.



If  $MT = 6$  and  $TN = 14$ , find  $PN$ .

$$6^2 + 6^2 = x^2$$

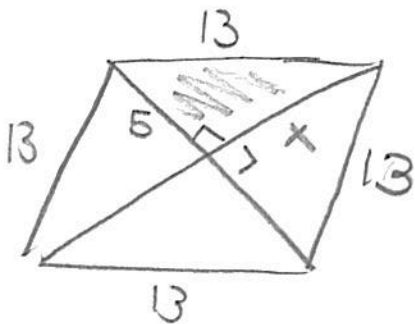
$$64 + 36 = x^2$$

$$100 = x^2$$

$$10 = x$$

$$\boxed{PN = 10}$$

- 15) The perimeter of a rhombus is 52 and the shorter diagonal is 10. Find the length of the longer diagonal.



$$P = 52$$

$$\text{each side} = 13$$

$$5^2 + x^2 = 13^2$$

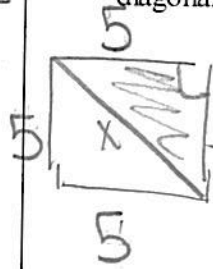
$$25 + x^2 = 169$$

$$x^2 = 144$$

$$x = 12$$

$$\boxed{\text{Diag} = 24}$$

- 16) Find, in simplest radical form, the length of a diagonal of a square whose perimeter is 20.



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

$$25 + 25 = x^2$$

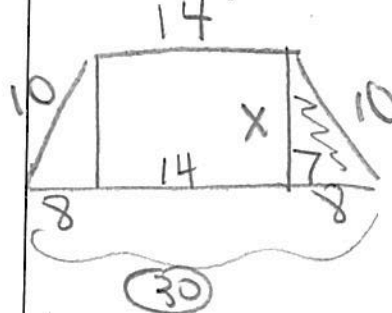
$$50 = x^2$$

$$\sqrt{50} = x$$

$$\sqrt{50} = \sqrt{25 \cdot 2}$$

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

- 17) In an isosceles trapezoid, the lengths of the bases are 14 and 30 and the length of each of the nonparallel sides is 10. Find the length of the altitude of the trapezoid.



$$x^2 + 8^2 = 10^2$$

$$x^2 + 64 = 100$$

$$x^2 = 36$$

$$\boxed{x = 6}$$

- 18) In right triangle ABC,  $m\angle A = (2x + 2)^\circ$ ,  $m\angle B = (7x + 7)^\circ$ , and  $m\angle C = 90^\circ$ . Find the value of  $x$ .



$$\underline{2x + 2} + \underline{7x + 7} + 90 = 180$$

$$9x + 99 = 180$$

$$\underline{-99 \quad -99}$$

$$\frac{9x}{9} = \frac{81}{9}$$

$$\boxed{x = 9}$$

