

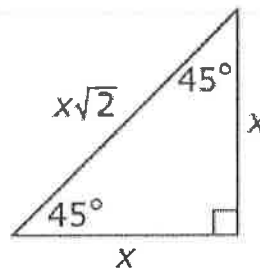
**NOTES: Isosceles Right Triangles**

FROM STAAR  
CHART

45°-45°-90° triangle

A diagonal of a square divides it into two congruent

Isosceles Right  
Triangles. Since the base angles of an isosceles triangle are equal, the measure of each acute angle is 45°. So another name for an isosceles right triangle is a 45°-45°-90° triangle.

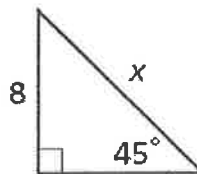


A 45°-45°-90° triangle is one type of Special Right  
Triangles.

**Example 1A: Finding Side Lengths in a 45°-45°-90° Triangle**

Find the value of  $x$ .

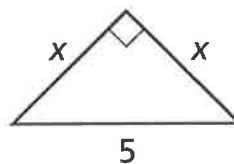
$8\sqrt{2}$



**Example 1B:**

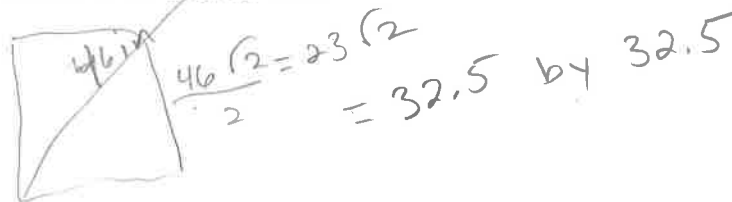
Find the value of  $x$ .

$\frac{5\sqrt{2}}{2}$



**Example 2:**

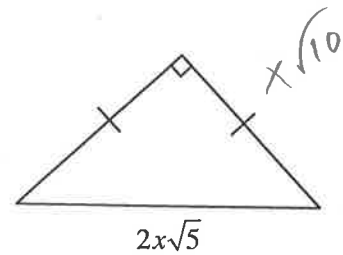
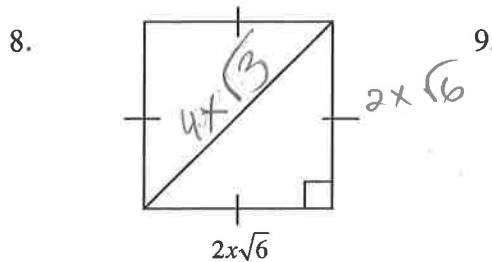
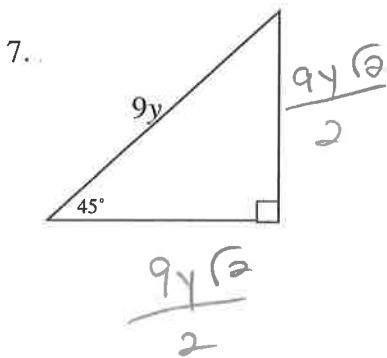
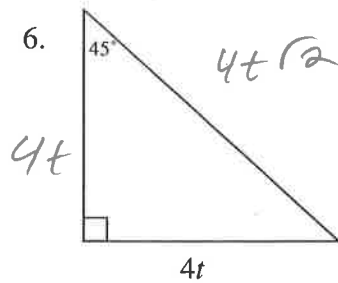
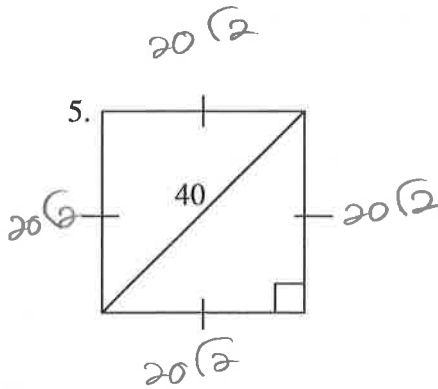
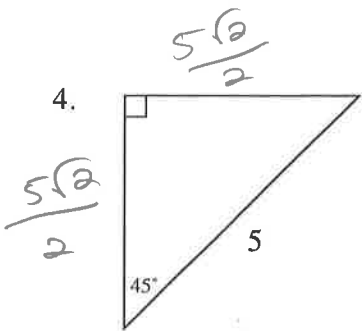
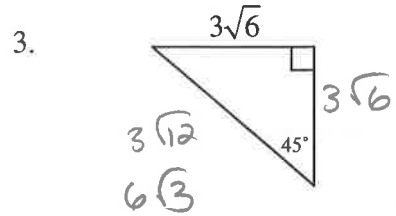
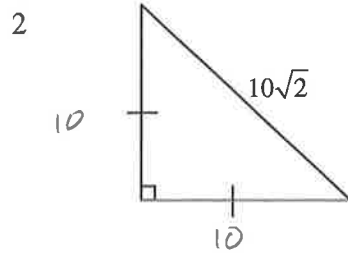
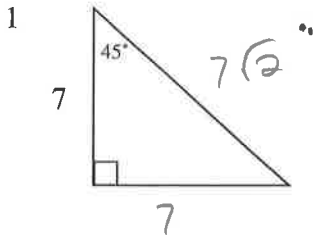
Jana is cutting a square of material for a tablecloth. The table's diagonal is 36 inches. She wants the diagonal of the tablecloth to be an extra 10 inches so it will hang over the edges of the table. What size square should Jana cut to make the tablecloth? Round to the nearest inch.



Name: \_\_\_\_\_ Period: \_\_\_\_\_

### Isosceles Right Triangles Assignment

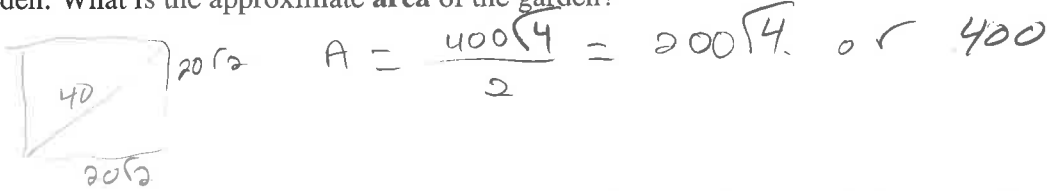
I. Fill in the length of each segment in the following figures.



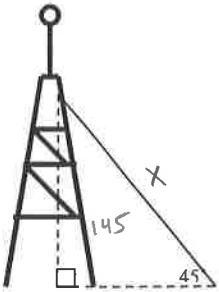
$2 \cdot 2x\sqrt{3}$

$$\frac{2x\sqrt{5} \cdot \sqrt{2}}{\sqrt{2} \sqrt{2}} = \frac{2x\sqrt{10} \times \sqrt{10}}{2}$$

16. Sam has a square backyard divided into 2 sections along the 40 foot diagonal. One of these sections is used as a garden. What is the approximate area of the garden?

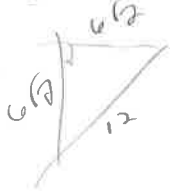


17. A guy wire supporting a radio tower is positioned 145 feet up the tower. It forms a 45° angle with the ground. About how long is the wire?



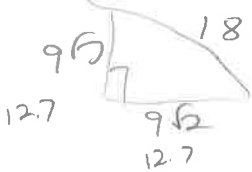
Handwritten calculation:  $x = 145\sqrt{2}$  or 205.06

18. Find the perimeter and area of a 45°-45°-90° triangle with a hypotenuse length 12 inches.



Handwritten calculations:  
 $P = 12\sqrt{2} + 12$  or 28.97  
 $A = \frac{(6\sqrt{2})(6\sqrt{2})}{2} = \frac{36 \cdot 2}{2} = 36 \text{ in}^2$

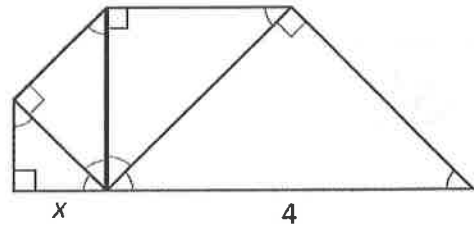
20. This triangle loom is made from wood strips shaped into a 45°-45°-90° triangle. Pegs are placed every 1/2 inch along each leg. Suppose you make a loom with an 18-inch hypotenuse. Approximately how many pegs will you need?



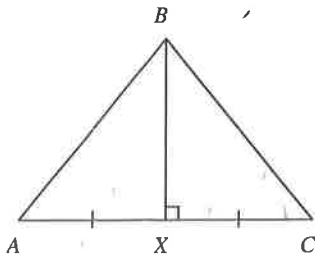
Handwritten calculation:  $\frac{25.4}{\frac{1}{2}} = 51 \text{ pegs}$

21. Find the value of x in simplest radical form.

Handwritten answer:  $x = 1$



24. Given AC = 10, find BX in simplest radical form.



FROM STAAR  
CHART

Notes:  $30^\circ-60^\circ-90^\circ$

A  $30^\circ-60^\circ-90^\circ$  triangle is another

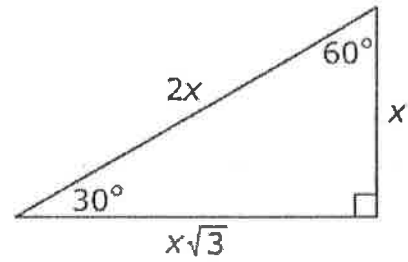
\_\_\_\_\_

\_\_\_\_\_. You can use an

\_\_\_\_\_ triangle to find a relationship

between the lengths.

$30^\circ-60^\circ-90^\circ$  triangle

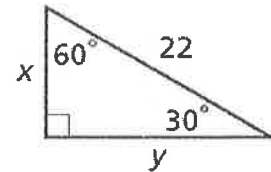


**Example 1A:** Finding Side Lengths in a  $30^\circ-60^\circ-90^\circ$  Triangle

Find the values of  $x$  and  $y$ . Give your answers in simplest radical form.

$$x = 11$$

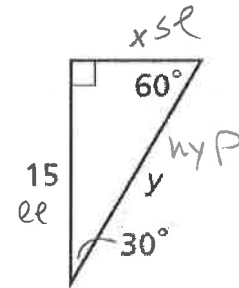
$$y = 11\sqrt{3}$$



**Example 1B:**

Find the values of  $x$  and  $y$ . Give your answers in simplest radical form.

$$x = 5\sqrt{3} \quad y = 10\sqrt{3}$$

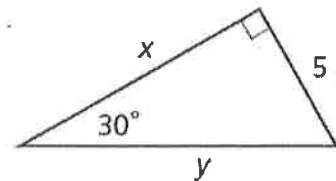


**Example 1C:**

Find the values of  $x$  and  $y$ . Give your answers in simplest radical form.

$$y = 10$$

$$x = 5\sqrt{3}$$

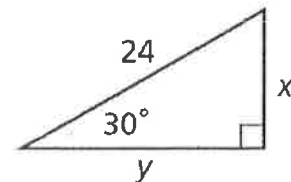


**Example 1D:**

Find the values of  $x$  and  $y$ . Give your answers in simplest radical form.

$$x = 12$$

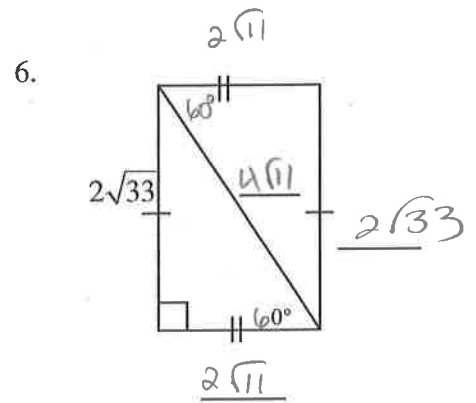
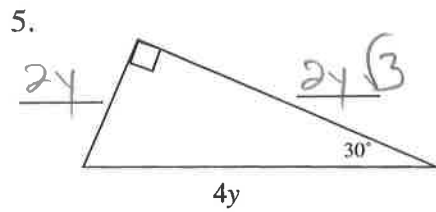
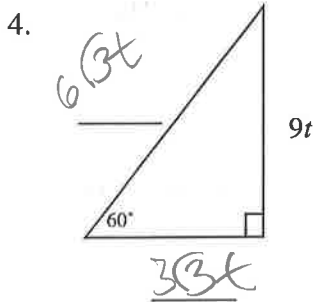
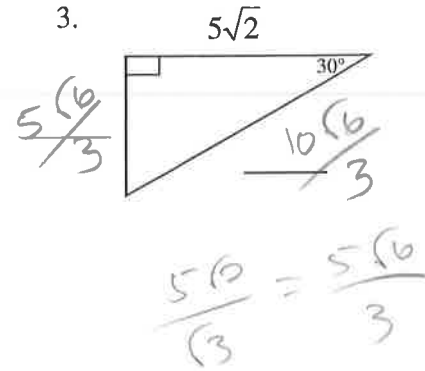
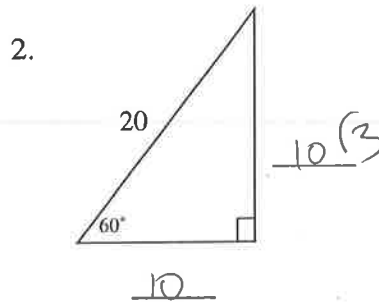
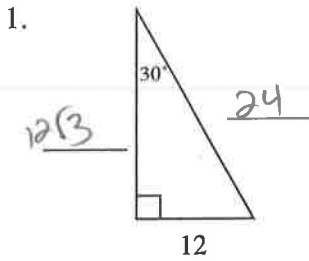
$$y = 12\sqrt{3}$$



Name: \_\_\_\_\_ Period: \_\_\_\_\_

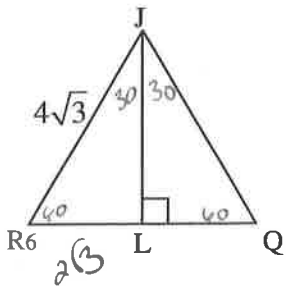
### 30°-60°-90° Triangles Assignment

Fill in the blanks for the special right triangles.



$\frac{9t}{\sqrt{3}} = \frac{9\sqrt{3}t}{3}$

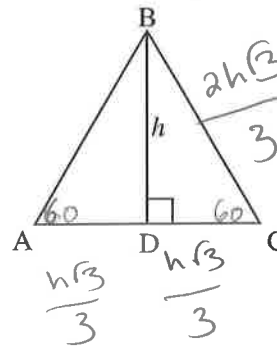
7.  $\triangle RJQ$  is equilateral.



JQ =  $4\sqrt{3}$   
 RL =  $2\sqrt{3}$   
 LQ =  $2\sqrt{3}$   
 JL =  $6$

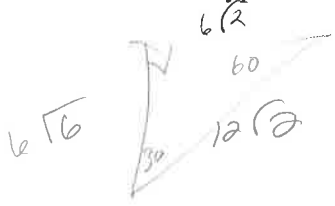
$2(\sqrt{3} \cdot \sqrt{3}) = 2 \cdot 3$

8.  $\triangle ABC$  is equilateral.



AD =  $\frac{h\sqrt{3}}{3}$   
 DC =  $\frac{h\sqrt{3}}{3}$   
 AB =  $\frac{2h\sqrt{3}}{3}$   
 BC =  $\frac{2h\sqrt{3}}{3}$

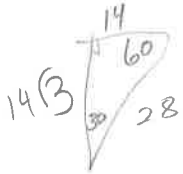
21. The hypotenuse of a 30-60-90 triangle is  $12\sqrt{2}$  ft. Find the area of the triangle.



$$A = \frac{6\sqrt{2} \cdot 6\sqrt{2}}{2} = \frac{36 \cdot 2}{2} = 36$$

36 or 62.4 ft<sup>2</sup>

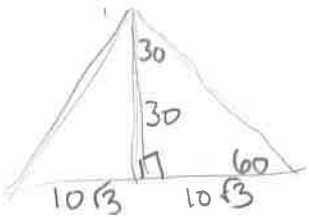
22. Find the perimeter and area of a 30°-60°-90° triangle with hypotenuse length 28 centimeters.



$$P = 28 + 14\sqrt{3} \text{ or } 66.2 \text{ cm}$$

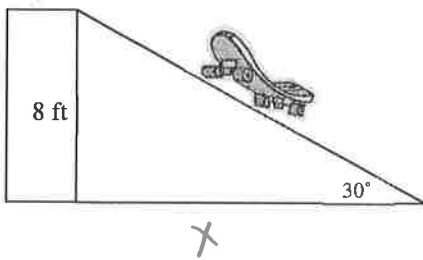
$$A = \frac{14 \cdot 14\sqrt{3}}{2} = 98\sqrt{3} \text{ or } 169.7 \text{ cm}^2$$

24. Find the perimeter and area of an equilateral triangle with height 30 yards.



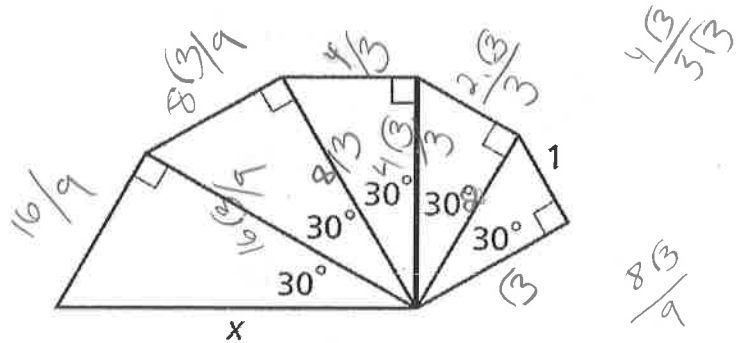
$$A = \frac{20\sqrt{3} \cdot 30}{2} = 300\sqrt{3} \text{ or } 519.6 \text{ yd}^2$$

25. A skate board ramp must be set up to rise from the ground at 30°. If the height from the ground to the platform is 8 feet, how far away from the platform must the ramp be set?



$$x = 8\sqrt{3} \text{ or } 13.9 \text{ ft}$$

26. Find the value of x.



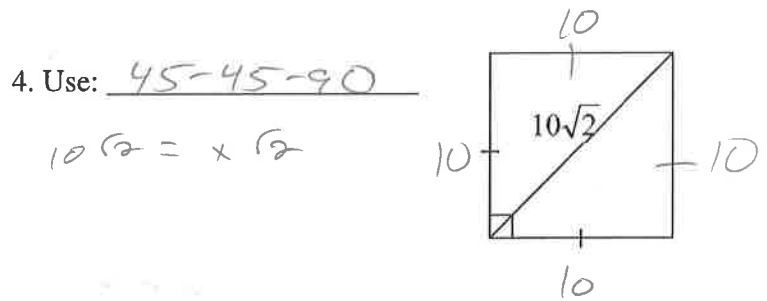
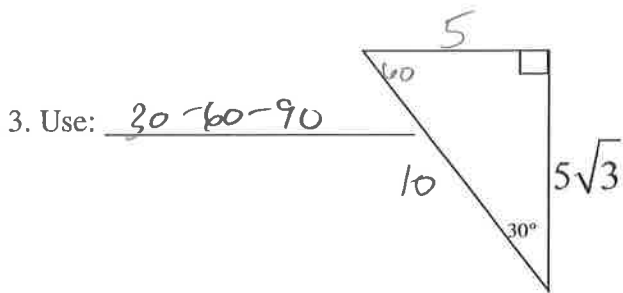
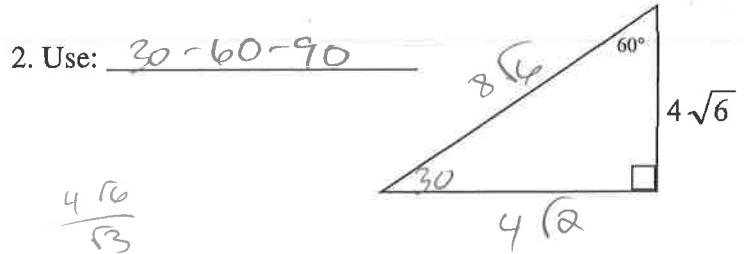
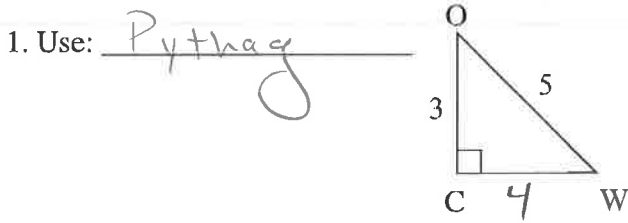
$$x = 32/9$$

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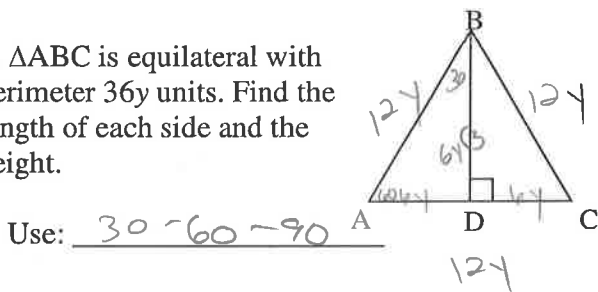
### Mixed Practice Assignment

I. For each problem:

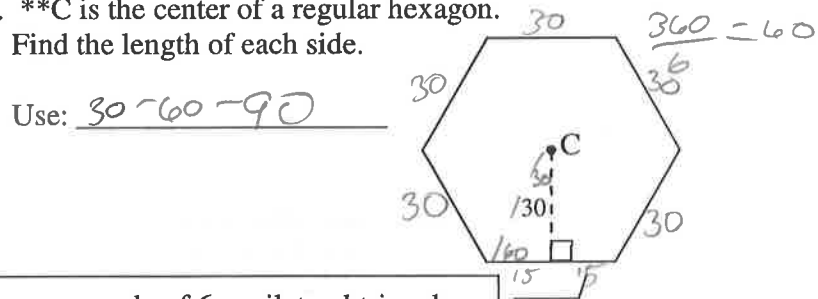
- 1) Determine if you should use Pythagorean Theorem, 30°-60°-90°, or 45°-45°-90°
- 2) Show work and find all the missing segment lengths



5.  $\triangle ABC$  is equilateral with perimeter 36y units. Find the length of each side and the height.



6. \*\*C is the center of a regular hexagon. Find the length of each side.

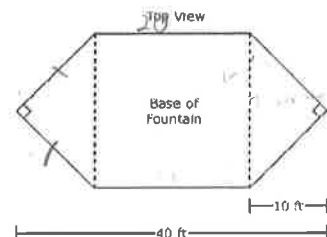


Hexagons are made of 6 equilateral triangles.

7. When viewed from above, the base of a water fountain has the shape of a hexagon composed of a square and 2 congruent isosceles right triangles, as represented in the diagram below.

Which of the following measurements best represents the perimeter of the water fountain's base in feet?

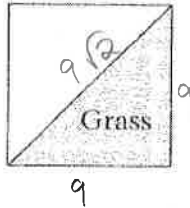
- A  $(20 + 20\sqrt{2})$  ft      C  $(20 + 20\sqrt{2})$  ft  
 B  $(20 + 20\sqrt{2})$  ft      D  $(20 + 20\sqrt{2})$  ft



- 8 Dante has a square yard with an area of  $81 \text{ ft}^2$ . He plants grass in one half of the yard as shown. What is the perimeter of the grass section?

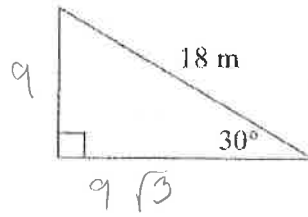
$18 + 9\sqrt{2}$   
or  
 $30.7$

Dante's Yard



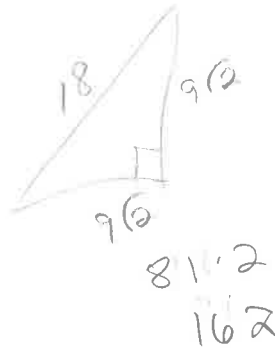
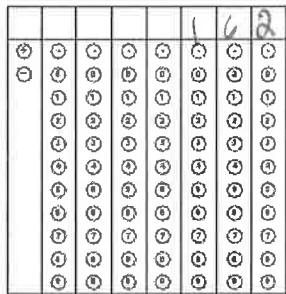
$A = s^2$   
 $81 = s^2$   
 $s = 9$

- 9 A triangular pathway in a park is shown below. What is the approximate total length of the path (the perimeter of the triangle)?



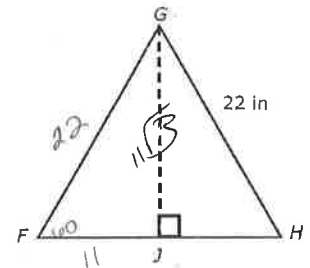
$27 + 9\sqrt{3}$   
or  
 $42.6$

- 10 Alex has a square garden in his back yard. If the garden has a diagonal of 18 inches, what is the area of Alex's square garden?



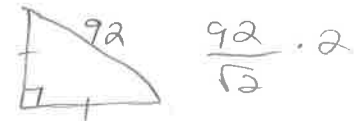
11.  $\triangle FGH$  is an equilateral triangle. Which value is closest to the perimeter of  $\triangle FGJ$ ?

- A 39 in
- B 52 in
- C 62 in
- D 66 in



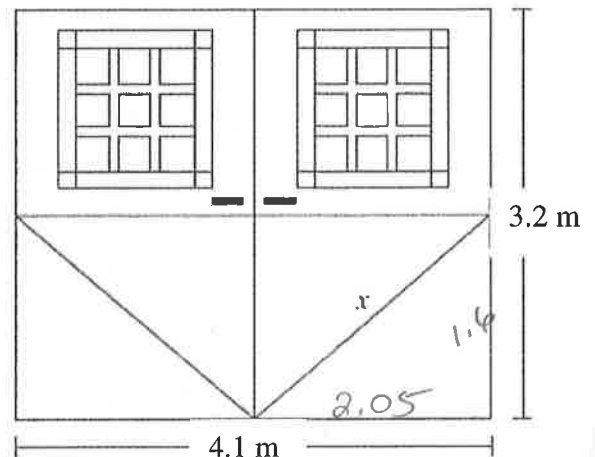
12. Nicole is creating a support in the shape of a right triangle. She has a 92 cm-long piece of wood, which is to be used for the hypotenuse. The two legs of the triangular support are of equal length. Approximately how many more centimeters of wood does Nicole need to complete the support?

- A 180 cm
- B 184 cm
- C 260 cm
- D 276 cm



13. Two identical rectangular doors have glass panes in the top half and each bottom half is made of solid wood. If 1 meter is approximately equal to 3.28 feet, what is the approximate length of  $x$  in feet?

- A 5.3 feet
- B 8.5 feet
- C 2.6 feet
- D 7.1 feet



$2.6 \text{ meters} \times 3.28$



14. Which of the following could be the side lengths of 45°-45°-90° triangle?

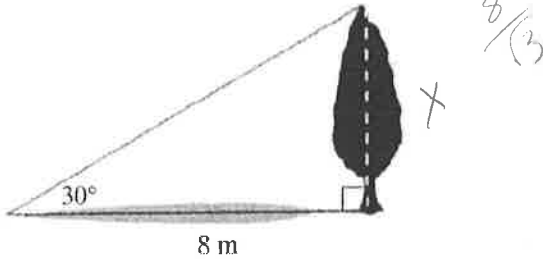
~~A~~ 2 in, 4 in, 2 2in

~~B~~ 2 in, 4 in, 2 3in

**C** 2 in, 2 in, 2√2in

D 4 in, 4 in, 4√3 in

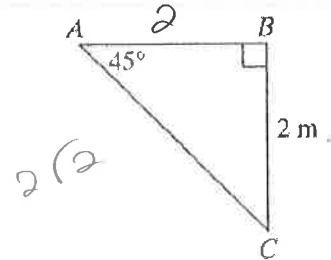
15. If a tree casts an 8-meter shadow, and the angle from the ground to the tree is 30°, what is the approximate height of the tree?



**A** 4.6 m  
B 6.3 m

C 13.7 m  
D 16 m

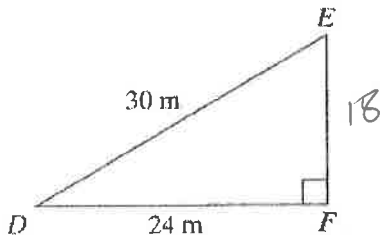
16. What is the approximate perimeter of triangle ABC?



F 2.0 m  
G 4.0 m

H 5.4 m  
**J** 6.8 m

17. What is the area of triangle DEF?



**A** 216 m<sup>2</sup>  
B 360 m<sup>2</sup>

C 432 m<sup>2</sup>  
D 720 m<sup>2</sup>

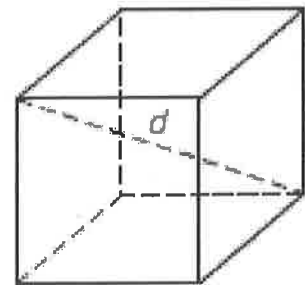
18. A cube with side lengths of 4 inches is shown below. How could you find the length of  $d$ , the diagonal of the cube?

A  $\sqrt{4^2 + (4\sqrt{3})^2} = d^2$

**B**  $\sqrt{4^2 + (4\sqrt{3})^2} = d$

C  $\sqrt{4+4} = d^2$

D  $\sqrt{4+4\sqrt{3}} = d^2$



19. Jenna is flying a kite on a very windy day. The kite string makes a 60° angle with the ground. The kite is directly above the sandbox, which is 28 feet away from where Jenna is standing. Approximately how much of the kite string is currently being used?

A 56 feet  
**B** 48.5 feet  
C 40 feet  
D 14 feet

