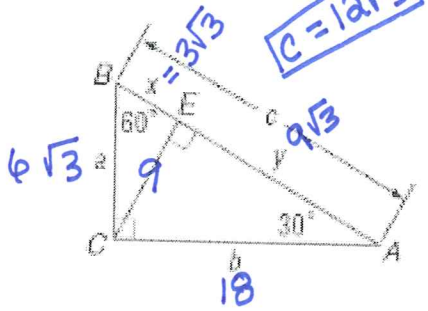
Key

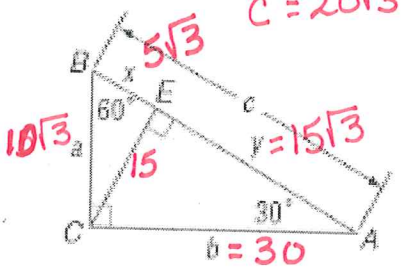
Special Right Triangles Day #2

1. Use triangle ABC. Find all missing variables.

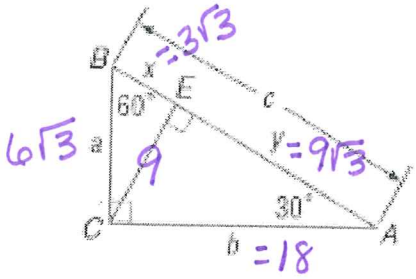
a. $a = 6\sqrt{3}$



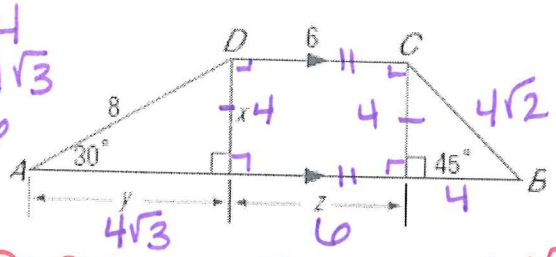
b. $y = 15\sqrt{3}$



c. $b = 18$



2. . Find x, y, z, and the perimeter of trapezoid $ABCD$.

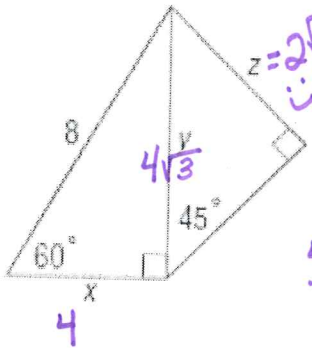


x = 4
y = 4√3
z = 6

P: 8 + 6 + 4√2 + 4 + 6 + 4√3

P = 24 + 4√2 + 4√3

3. Find x, y, and z.

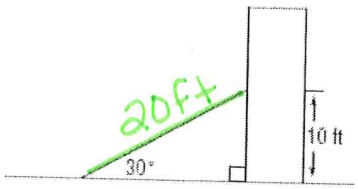


$\frac{4\sqrt{3}}{\sqrt{2}} = \frac{\text{leg}\sqrt{2}}{\sqrt{2}}$

$\frac{4\sqrt{3}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{6}}{\sqrt{4}}$

$= \frac{4\sqrt{6}}{2} = 2\sqrt{6}$

4. A ladder is propped against a building at a 30° angle.

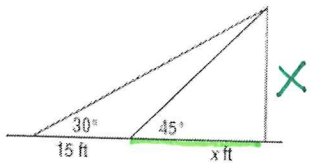


What is the length of the ladder?

A 5 ft
B 10 ft
C $10\sqrt{3}$ ft
D 20 ft

MOVIES For Exercises 5–7, use the following information.

Kim and Yolanda are watching a movie in a movie theater. Yolanda is sitting x feet from the screen and Kim is 15 feet behind Yolanda.



The angle that Kim's line of sight to the top of the screen makes with the horizontal is 30°. The angle that Yolanda's line of sight to the top of the screen makes with the horizontal is 45°.

5. How high is the top of the screen in terms of x?

6. What is $\frac{x+15}{x}$?

$\frac{x+15}{x} = \frac{x\sqrt{3}}{x}$

$\frac{x+15}{x} = \sqrt{3}$

$x + 15 = x\sqrt{3}$

$15 = x\sqrt{3} - x$

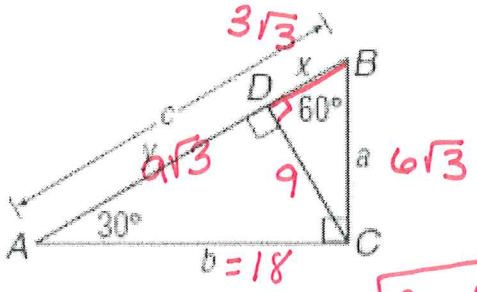
$x(\sqrt{3} - 1)$

$\frac{15}{(\sqrt{3}-1)}$

7. How far is Yolanda from the screen? Round your answer to the nearest tenth.

20.5ft

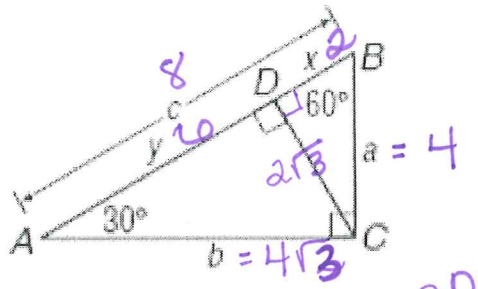
8. If $x = 3\sqrt{3}$, find a and CD.



$a = 6\sqrt{3}$

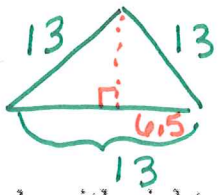
$CD = 9$

9. If $a = 4$, find CD, b, and y.



$CD = 2\sqrt{3}$
$b = 4\sqrt{3}$
$y = 6$

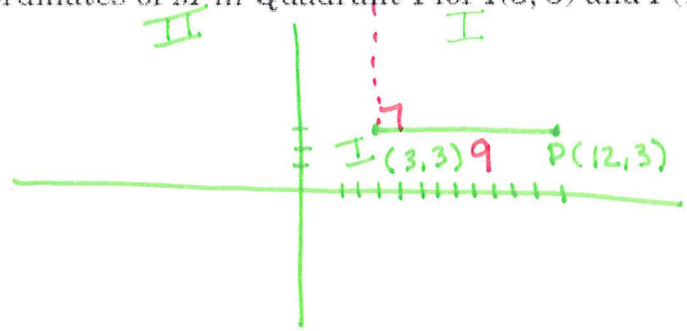
10. The perimeter of an equilateral triangle is 39 centimeters. Find the length of an altitude of the triangle.



$39 \div 3 = 13$

altitude $= 6.5\sqrt{3}$

11. $\triangle MIP$ is a 30°-60°-90° triangle with right angle at I, and $\overline{IP}$ the longer leg. Find the coordinates of M in Quadrant I for $I(3, 3)$ and $P(12, 3)$.



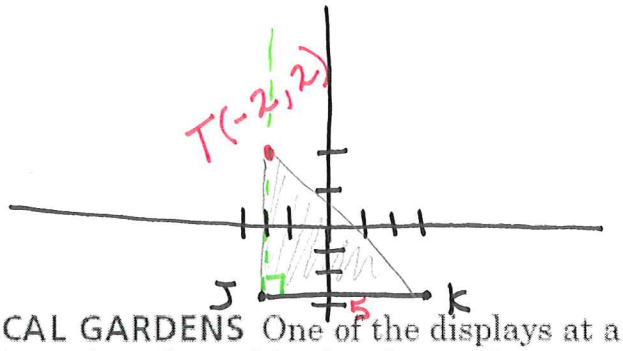
need short leg

$9 = \text{short} \cdot \sqrt{3}$

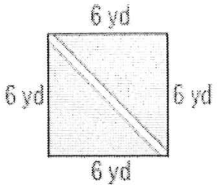
$\text{short} = 3\sqrt{3}$

$\therefore M(3, 3+3\sqrt{3})$

12. $\triangle TJK$ is a 45°-45°-90° triangle with right angle at J. Find the coordinates of T in Quadrant II for $J(-2, -3)$ and $K(3, -3)$.



13. BOTANICAL GARDENS One of the displays at a botanical garden is an herb garden planted in the shape of a square. The square measures 6 yards on each side. Visitors can view the herbs from a diagonal pathway through the garden. How long is the pathway?



$6\sqrt{2}$ yards :)

easy!