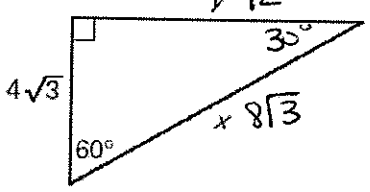
Geometry Homework Day 2

7.4 Special Right Triangles

Name Key

Find the value of each variable. Write your answers in simplest radical form.

1.



$2s = h$ $\quad s\sqrt{3} = l$

$2(4\sqrt{3}) = x$ $\quad 4\sqrt{3}\cdot\sqrt{3} = y$

$8\sqrt{3} = x$ $\quad 12 = y$

$x = 8\sqrt{3}$

$y = 12$

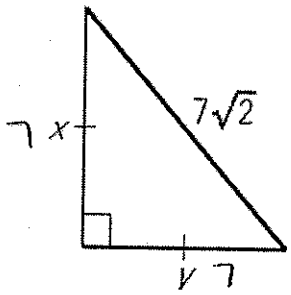
2.

$l\sqrt{2} = h$

$x\sqrt{2} = 7\sqrt{2}$

$x = 7$

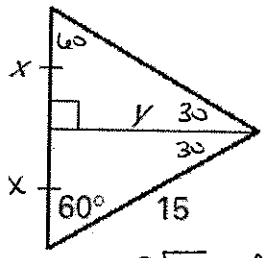
$y = 7$



$x = 7$

$y = 7$

3.



$2s = h$ $\quad s\sqrt{3} = l$

$2s = 15$ $\quad \frac{15}{2}\cdot\sqrt{3} = l$

$x = \frac{15}{2}$ $\quad \frac{15\sqrt{3}}{2} = y$

$x = \frac{15}{2} = 7.5$

$y = \frac{15\sqrt{3}}{2} = 7.5\sqrt{3}$

4.

$2s = h$

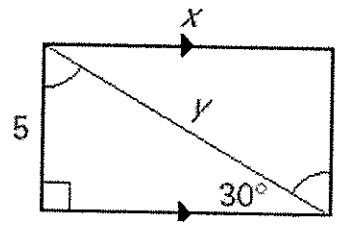
$2(5) = y$

$10 = y$

$2s = h$ $\quad s\sqrt{3} = l$

$2s = 10$ $\quad 5\sqrt{3} = x$

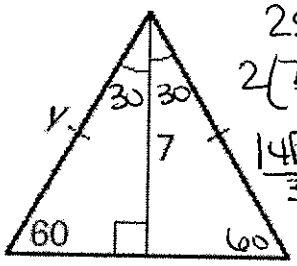
$s = 5$



$x = 5\sqrt{3}$

$y = 10$

5.



$2s = h$ $\quad s\sqrt{3} = l$

$2\left(\frac{7\sqrt{3}}{3}\right) = y$ $\quad s\sqrt{3} = 7$

$\frac{14\sqrt{3}}{3} = y$ $\quad s = \frac{7}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}$

$s = \frac{7\sqrt{3}}{3}$

$x = \frac{7\sqrt{3}}{3}$

$x = \frac{7\sqrt{3}}{3}$ $\quad y = \frac{14\sqrt{3}}{3}$

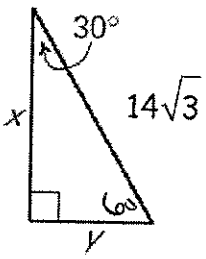
6.

$2s = h$ $\quad s\sqrt{3} = l$

$2s = 14\sqrt{3}$ $\quad 7\sqrt{3}\cdot\sqrt{3} = x$

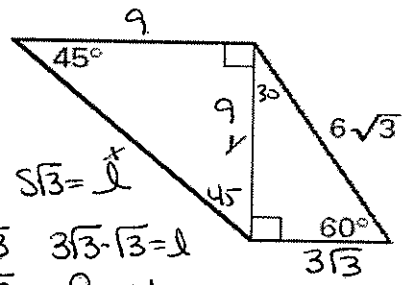
$s = 7\sqrt{3}$ $\quad 7\cdot 3 = x$

$y = 7\sqrt{3}$ $\quad 21 = x$



$x = 21$ $\quad y = 7\sqrt{3}$

7.



$2s = h$ $\quad s\sqrt{3} = l$

$2s = 6\sqrt{3}$ $\quad 3\sqrt{3}\cdot\sqrt{3} = l$

$s = 3\sqrt{3}$ $\quad 9 = y$

$l\sqrt{2} = h$

$9\sqrt{2} = x$

$x = 9\sqrt{2}$

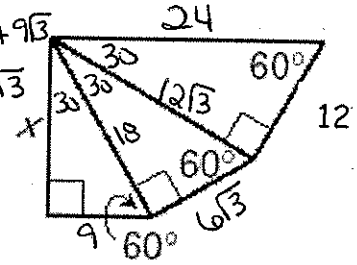
$y = 9$

8. Solve for x (exact answer). Also find the perimeter of the entire figure.

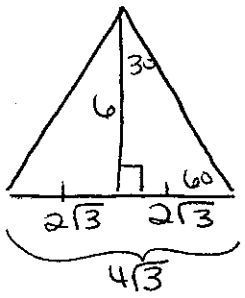
$x = 9\sqrt{3}$

$P = 24 + 12 + 6\sqrt{3} + 9 + 9\sqrt{3}$

$P = 45 + 15\sqrt{3}$



9. An altitude of an equilateral triangle is 6 inches. What is the area of the triangle?



$2s = h$ $\quad s\sqrt{3} = l$

$s\sqrt{3} = 6$

$s = \frac{6}{\sqrt{3}}$

$s = \frac{6\sqrt{3}}{3}$

$\boxed{s = 2\sqrt{3}}$

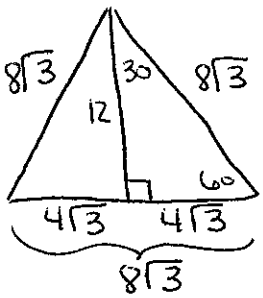
$A_\Delta = \frac{1}{2}bh$

$= \frac{1}{2}(4\sqrt{3})(6)$

$= 12\sqrt{3}\ in^2$

$A_\Delta = 12\sqrt{3}\ in^2$

10. The altitude of an equilateral triangle is 12 cm. Find the perimeter of the triangle. Round to the nearest tenth.



$s\sqrt{3} = l$

$s\sqrt{3} = 12$

$s = \frac{12}{\sqrt{3}}$

$s = \frac{12\sqrt{3}}{3}$

$s = 4\sqrt{3}$

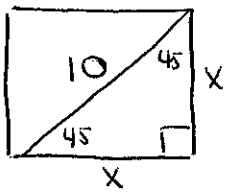
$P = 3(8\sqrt{3})$

$= 24\sqrt{3}$

$\approx 41.5692\ldots$

$P_\Delta = 41.6\ cm$

11. The length of the diagonal of a square is 10 meters. What is the perimeter of the square?



$l\sqrt{2} = h$

$l\sqrt{2} = 10$

$l = \frac{10}{\sqrt{2}}$

$x = \frac{10\sqrt{2}}{2}$

$x = 5\sqrt{2}$

$P_\square = 4(5\sqrt{2})$

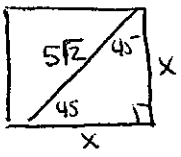
$= 20\sqrt{2}$

$\approx 28.284\ldots$

$P = 20\sqrt{2}\ m$

$\approx 28.3\ m$

12. The diagonal of a square is $5\sqrt{2}$ cm. What is the area of the square?



$l\sqrt{2} = h$

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

$x = 5$

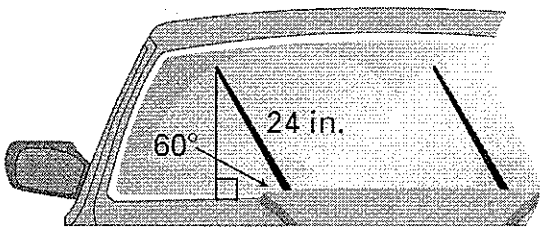
$A_{sq} = s^2$

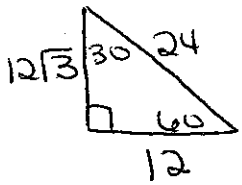
$= 5^2$

$= 25$

$A = 25\ cm^2$

13. A car is turned off while the windshield wipers are moving. The 24 inch wipers stop, making a 60° angle with the bottom of the windshield. How far from the bottom of the windshield are the ends of the wipers?





$12\sqrt{3} \approx 20.7846\ldots$

$2s = h$ $\quad s\sqrt{3} = l$

$2s = 24$ $\quad 12\sqrt{3} = l$

$s = 12$

$12\sqrt{3}\ inches$

$\approx 20.8\ inches$