Honors Geometry
Chapter 9
Right Triangle Practice

Challenging

Name Answer Key

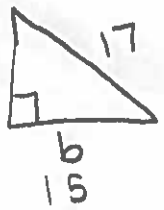
★ Pictures/Diagrams are not drawn to scale.

Work Area:

1. The area of a right triangle is 60 square inches and one leg is 15 inches.
Determine the length of the ~~hypotenuse~~.

hypotenuse = 17

$8 \times h$

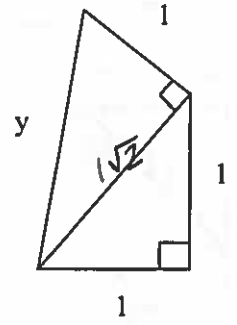


$60 = \frac{15x}{2}$

$120 = 15x$

$8 = x$

2. Find y



$1^2 + (\sqrt{2})^2 = y^2$

$1 + 2 = y^2$

$3 = y^2$

$\sqrt{3} = y$

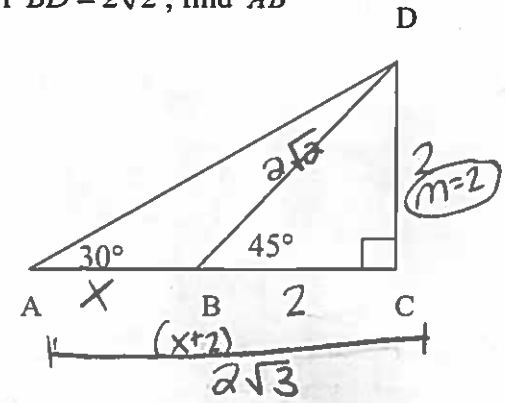
$8^2 + 15^2 = c^2$

$64 + 225 = c^2$

$289 = c^2$

$17 = c$

3. If $\overline{BD} = 2\sqrt{2}$, find $\overline{AB}$



45-45-90
m m $m\sqrt{2}$

30-60-90
m $m\sqrt{3}$ 2m

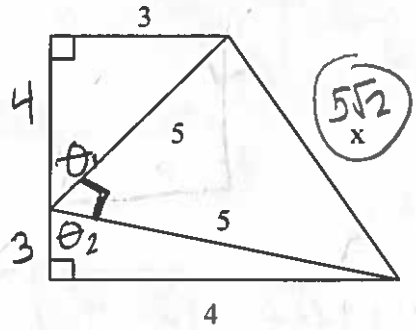
$\tan 30 = \frac{2}{x+2}$

$x+2 = \frac{2}{\tan 30}$

$x = \frac{2}{\tan 30} - 2$

$x = 2\sqrt{3} - 2 \approx 1.46$

4. Find x



$\tan\theta_1 = \frac{3}{4}$

$\theta_1 \approx 36.87°$

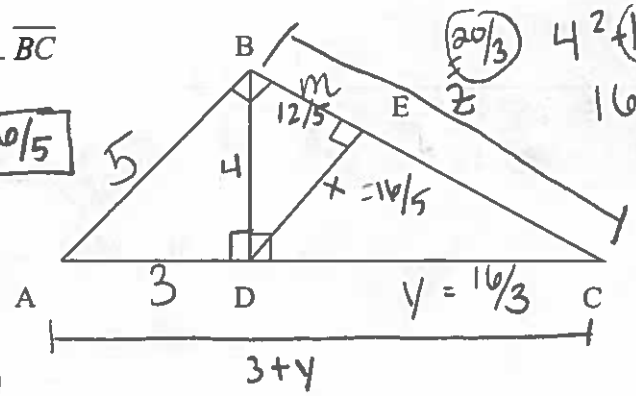
$\tan\theta_2 = \frac{4}{3}$

$\theta_2 \approx 53.13$

complementary

$x = 5\sqrt{2}$

5. In $\Delta ABC, m\angle B = 90°$
$\overline{BD} \perp \overline{AC}$ and $\overline{DE} \perp \overline{BC}$
$\overline{AB} = 5$ and $\overline{AD} = 3$
Find $\overline{DE}$ DE = 16/5



$\frac{5}{3} = \frac{3+y}{5}$

$25 = 9 + 3y$

$16 = 3y$ $(y = 16/3)$

$4^2 + (16/3)^2 = z^2$

$16 + \frac{256}{9} = z^2$

$44\frac{4}{9} = z^2$

$\sqrt{\frac{400}{9}} = z$

$\frac{20}{3} = z$

$\frac{4}{m} = \frac{20/3}{4}$

$16 = \frac{20}{3}m$

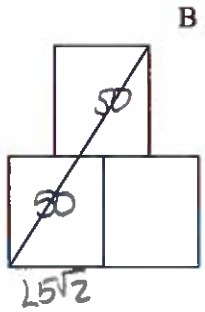
$\frac{12}{5} = m$

$x^2 + (\frac{12}{5})^2 = 4^2$

$x^2 + \frac{144}{25} = 16$

$x^2 = \frac{256}{25}$

6. Three congruent squares are drawn as shown, in which the midpoints of two sides of the bottom squares are vertices of the top square. If $\overline{AB} = 100$, what is the area of one of these squares?



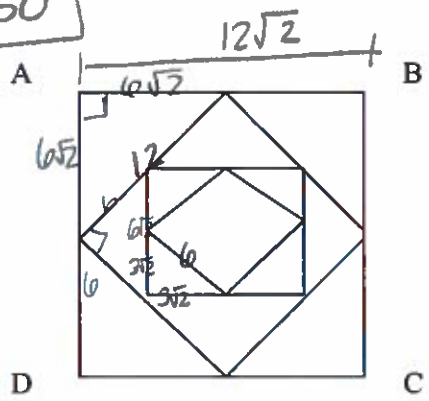
$m\sqrt{2} = 50$

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

$A = (25\sqrt{2})(25\sqrt{2})$

$A = 1250$

7. ABCD is a square with $AB = 12\sqrt{2}$ inches. Each of the inner figures is a square formed by connecting midpoints. What is the length of a side of the innermost square shown?



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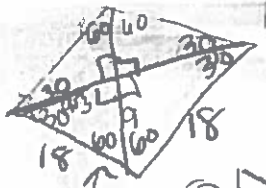
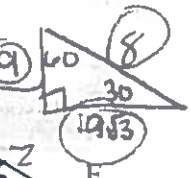
8. The perimeter of a rhombus containing a 120° angle is 72 cm. Determine the area of the rhombus.

$P = 72$

Side length $72/4 = 18$

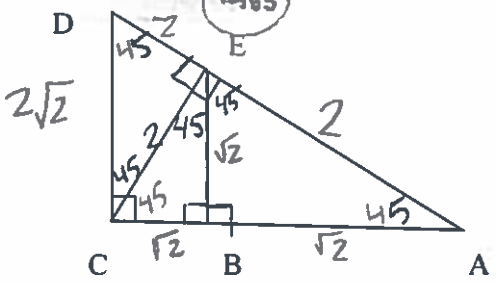




$A = 4\left(\frac{1}{2}(9)(9\sqrt{3})\right)$

$A = 160\sqrt{3}$

9. Given $m\angle CEB = 45°, EC = 2$. Determine the sum of the perimeters of ΔABE and ΔEDC.



$m\sqrt{2} = 2$

$\frac{m\sqrt{2}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \sqrt{2}$

$P_{\Delta ABE} = \sqrt{2} + \sqrt{2} + 2$

$2\sqrt{2} + 2$

$P_{\Delta EDC} = 2 + 2 + 2\sqrt{2}$

$4 + 2\sqrt{2}$

$\text{SUM} = 2\sqrt{2} + 2 + 4 + 2\sqrt{2} = 6 + 4\sqrt{2}$

10. Given right ΔABC, with AD as an altitude, $AD = 5$, $m\angle DAB = 30$, determine AC, AB, BD, and DC.

$AC = 10$

$AB = 10\sqrt{3}/3$

$BD = 5\sqrt{3}/3$

$DC = 5\sqrt{3}$

$m\sqrt{3} = 5$

$\frac{m\sqrt{3}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$