

Honors Geometry

Practice Test

* Look Carefully at #10

Name(s) Key

Part I. Fill in the blanks:

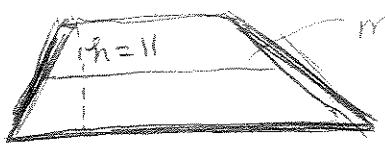
- If linear units measure distance, then square units measure area.
- Give the formulas for the areas of :
 - Rectangle: bh
 - Square: x^2 or $\frac{1}{2}ap$
 - Parallelogram: bh
 - Triangle: $\frac{1}{2}bh$ or $\sqrt{s(s-a)(s-b)(s-c)}$
(using only the lengths of its sides)
 - Trapezoid: $\frac{1}{2}h(b_1 + b_2)$ or (Median)(height)
(using the median)
 - Kite: $\frac{1}{2}(d_1)(d_2)$
 - Rhombus: $\frac{1}{2}(d_1)(d_2)$ or bh
 - Equilateral Triangle (using the measure of a side): $\frac{x^2\sqrt{3}}{4}$ or $\frac{1}{2}ap$
 - Regular Polygon: $\frac{1}{2}(\text{apothem})(\text{perimeter})$
 - Circle: πr^2
 - Sector: $\frac{\theta}{360} \pi r^2$
 - Circle's Segment: $A_{\text{sector}} - A_{\Delta}$
 - The area of a cyclic quadrilateral: $\sqrt{(s-a)(s-b)(s-c)(s-d)}$
(using only the lengths of its sides)
- If two closed figures are congruent, then their areas are equal.
- If two closed regions intersect only along a common boundary, then the area of their union is equal to the sum of their individual areas
- The median of a trapezoid is segment that joins midpts of the legs / the average of the base
- The ratio of the areas of two similar figures is $(S_1)^2 : (S_2)^2$

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Part II: Draw a picture and find the area of each of the figures described below. Give exact values as answers.

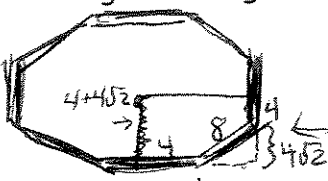
7. A triangle with sides measuring 18, 80 and 82 inches. ^(this is a 9-40-41 right Δ) $A = \underline{720 \text{ in}^2}$
 perimeter = 90
 $(90)(90-18)(90-80)(90-82)$
 $A = \frac{1}{2}(18)(80) = 720 \text{ in}^2$

8. An isosceles trapezoid with a median of 15 feet, legs which measure 13 feet, and a height of 11 feet.
 $A = \underline{165 \text{ ft}^2}$



9. A circle with a circumference of 36π mm.
 $C = 2\pi r = 36\pi$ $A = 18^2 \pi$
 $r = 18$
 $A = \underline{324 \pi \text{ mm}^2}$

10. A regular octagon with sides measuring 8 yards each.
 $a = 4 + 4\sqrt{2}$
 $P = 8(8) = 64$
 $A = \underline{128 + 128\sqrt{2} \text{ yds}^2}$

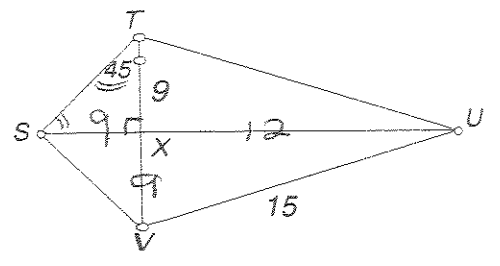


11. A sector whose arc measure is 150 and radius is 6.
 $\frac{150}{360}(\pi)6^2 = \frac{15}{36}(36\pi)$
 $A = \underline{15\pi \text{ u}^2}$

12. An inscribed quadrilateral with side lengths 13, 5, 9, and 11.
 Semiperimeter = $\frac{13+5+9+11}{2} = 19$
 $A = \sqrt{(19-13)(19-5)(19-9)(19-11)}$
 $= \sqrt{6 \cdot 14 \cdot 10 \cdot 8} = \sqrt{2 \cdot 3 \cdot 2 \cdot 7 \cdot 2 \cdot 5 \cdot 2 \cdot 4} = 2 \cdot 2 \cdot 2 \sqrt{105} = 8\sqrt{105}$
 $A = \underline{8\sqrt{105} \text{ u}^2}$

Part III. Solve each problem as indicated.

13. Find the area of kite STUV given that $\angle STX = 45^\circ$, $UV = 15$ and $TX = 9$
 $A_{\text{kite}} = \frac{1}{2}d_1 d_2 = \frac{1}{2}(21)(18) = \underline{189 \text{ u}^2}$

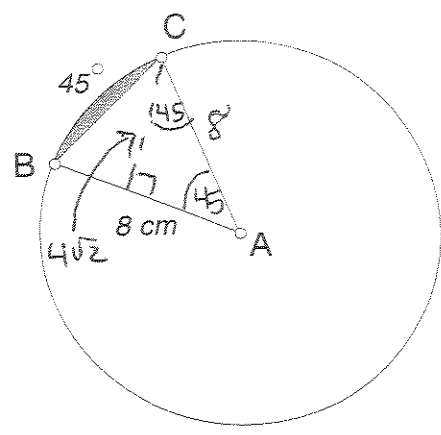
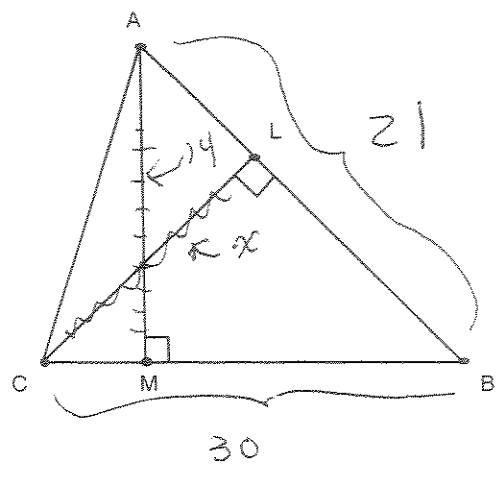


y

8. If $AM = 14$, $AB = 21$, and $CB = 30$ in the triangle at the right, find CL .

$$A_{\Delta} = \frac{1}{2}(14)(30) = \frac{1}{2}(x)(21)$$

$$CL = x = \boxed{20}$$



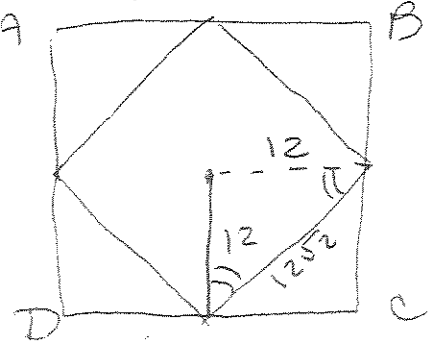
19.) Find the area of the shaded region in the diagram to the left to the nearest hundredth.

$$A_{\text{segment}} = A_{\text{sector}} - A_{\Delta}$$

$$= \frac{45}{360}(64\pi) - \frac{1}{2}(4\sqrt{2})(8)$$

$$= \boxed{8\pi - 16\sqrt{2} \text{ cm}^2}$$

20. The midpoints of the sides of a square, ABCD, are connected to form another square, WXYZ. If the apothem of square ABCD is 12, find the perimeter and area of square WXYZ.



$$P = 4(12\sqrt{2}) = \boxed{48\sqrt{2}}$$

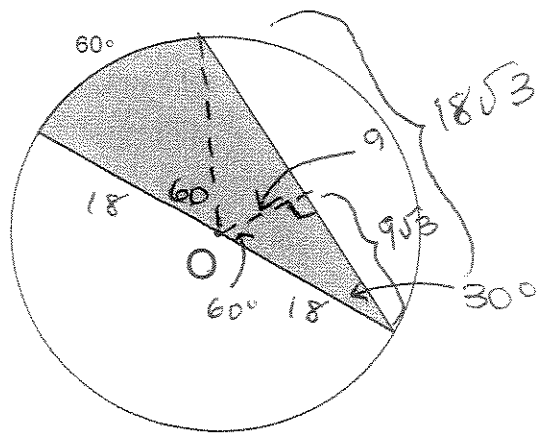
$$A = (12\sqrt{2})^2 = \boxed{144 \cdot 2 = 288 \text{ u}^2}$$

21. Find the area of the shaded portion of circle O with radius 18 to the right.

$$A_{\text{sector}} + A_{\Delta} = A_{\text{shaded}}$$

$$\frac{60}{360}(18^2\pi) + \frac{1}{2}(9)(18\sqrt{3})$$

$$\boxed{54\pi + 81\sqrt{3} \text{ u}^2}$$



***For additional practice, there are some great problems in the book... Try these:
P. 554 - 559 # 16, 18-20, 22, 27-29, 31, 34, 38, 40, 43, 44

14. Given the figure at right:

a) Find the ratio of the area of figure I to the area of the entire figure.

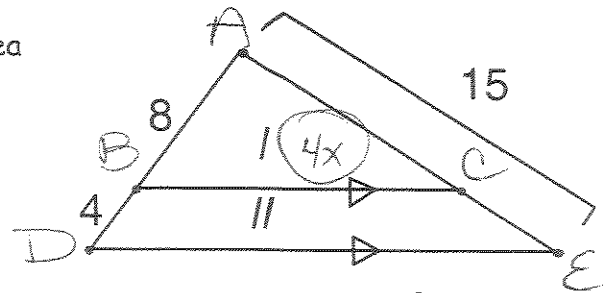
$$\triangle ABC \sim \triangle ADE$$

$$\sim \text{ratio} \rightarrow \frac{s_1}{s_2} = \frac{8}{12} = \frac{2}{3}$$

$$\frac{A_1}{A_2} = \left(\frac{2}{3}\right)^2 = \boxed{\frac{4}{9}}$$

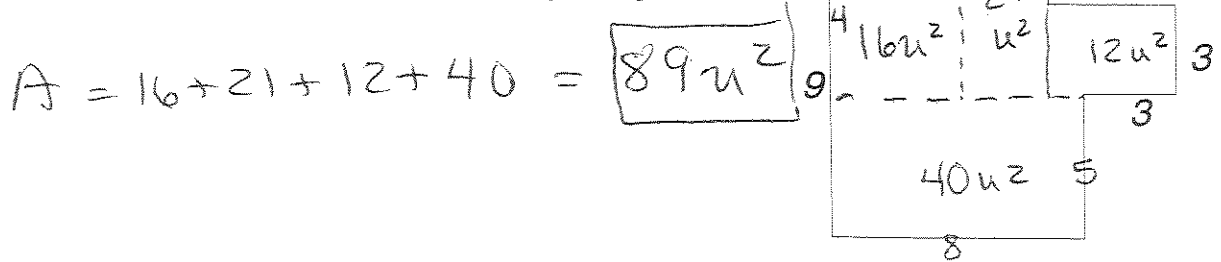
b) Find the ratio of the area of figure II to the area of the entire figure

$$\frac{5x}{9x} = \boxed{\frac{5}{9}}$$



$$\begin{cases} A_{\text{whole}} = 9x \\ A_I + A_{II} = 4x + A_{II} = 9x \\ A_{II} = 5x \end{cases}$$

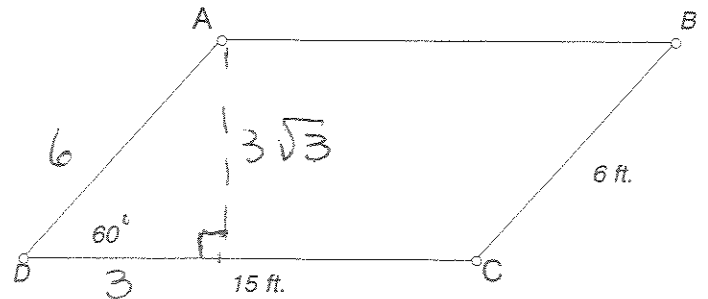
15. Find the area of the following figure (assume right angles):



$$A = 16 + 21 + 12 + 40 = \boxed{89u^2}$$

16. Find the area of parallelogram ABCD.

$$\begin{aligned} A &= b h \\ &= 15(3\sqrt{3}) \\ &= \boxed{45\sqrt{3} \text{ ft}^2} \end{aligned}$$



17. Find the area of the unshaded region in the figure to the right.

$$A_{\text{unshaded}} = A_{\triangle} - A_{\odot}$$

$$\begin{aligned} A_{\triangle} &= \frac{1}{2} a p = \frac{1}{2}(5)(30\sqrt{3}) \\ &= 75\sqrt{3} \end{aligned}$$

$$A_{\odot} = 25\pi$$

$$A_{\text{unshaded}} = \boxed{75\sqrt{3} - 25\pi \text{ u}^2}$$

