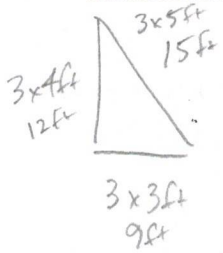
Applied Geometry – Perimeter and Area test

Find perimeter and area of the following figures (problem 1 and 2):

6

1. (Right) Triangle with sides 9 feet, 12 feet, and 15 feet. Show your work (formula and calculations). Make sure to include units. (Perimeter 2 points; Area 4 points)

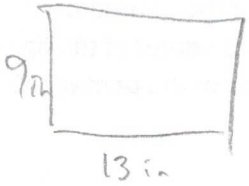


$P = 9ft + 12ft + 15ft = 36ft$

$A = \frac{bh}{2} = \frac{(9ft)(12ft)}{2} = 54ft^2$

4

2. Rectangle with sides 9 inches, and 13 inches. Show your work (formula and calculations). Make sure to include units. (Perimeter 2 points; Area 2 points)

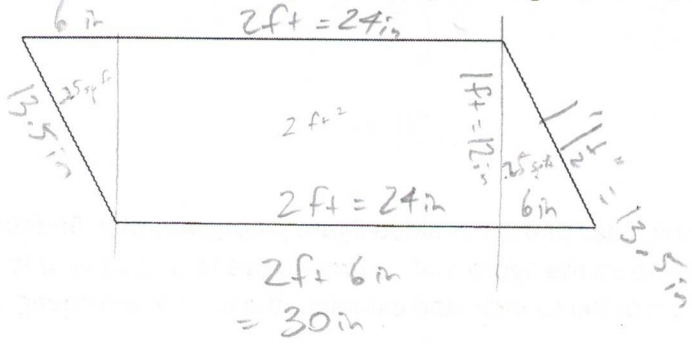


$P = 9in + 9in + 13in + 13in = 44in$

$A = bh = (9in)(13in) = 117in^2$

8

3. The figure below is drawn at a scale of 1"= 1'. Use a scale or ruler to measure the sides (and height) of the figure (parallelogram), then find the perimeter (2 points) and area (4 points). Draw on the figure to show what you use as your heights, bases, etc. (2 points)



$P = 30in + 30in + 13.5in + 13.5in = 87in$

$= 7.25ft$

$A = A_R + 2A_T$

$= 288in^2 + 2(36in^2) = 360in^2$

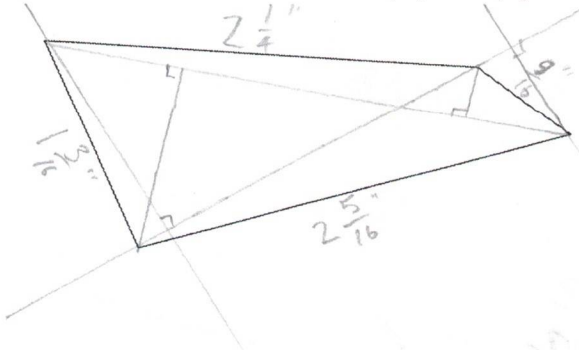
$= 2.5ft^2$

$A_R = (24in)(12in) = 288in^2 = 2ft^2$

$A_T = \frac{bh}{2} = \frac{(6in)(12in)}{2} = 36in^2$

4

4. Use a scale or ruler to measure the sides (and height) of the figure (quadrilateral), then find the perimeter (2 points). Draw on the figure and label it to show what you would use as your heights, bases, etc. to find the area. (2 points) [You do not need to calculate the area.]



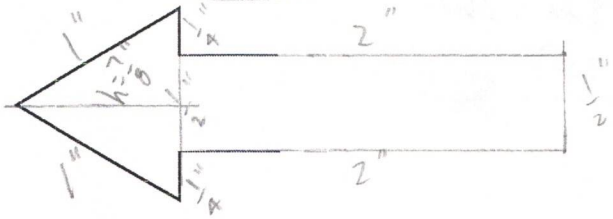
$P = 2\frac{4}{16}" + \frac{9}{16}" + 2\frac{5}{16}" + 1\frac{3}{16}" = 5\frac{4+9+5+3}{16}"$

$5\frac{21}{16}" = 6\frac{5}{16}"$

44 points normalized to 20 (or 40) points 22

10

5. Use a scale and straight edge to draw a 7-sided figure that looks like an arrow (2 points). The arrowhead and lines are started below. It must have a perimeter of 7 inches (2 points). Draw on the figure to show what you use as your heights, bases, etc. (2 points) Then, find the area of the figure. (4 points)



$P = 1" + 1" + \frac{1}{4}" + 2" + \frac{1}{2}" + 2" + \frac{1}{4}" = 7 in$

$A = A_R + A_T = 1in^2 + 0.4375 in^2$

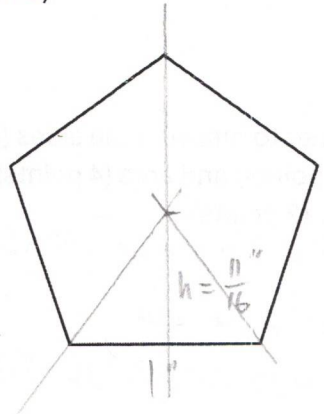
$= 1.4375 in^2$

$A_R = b \cdot h = 2" \times \frac{1}{2}" = 1 sq in$

$A_T = \frac{bh}{2} = \frac{1" \cdot \frac{7}{8}"}{2} = \frac{\frac{7}{8} in^2}{2} = \frac{7}{16} in^2 = 0.4375 in^2$

8

6. Use a scale or ruler to measure the sides of the figure (pentagon), then find the perimeter (2 points). Draw the perpendicular distance from one side to the approximate center of the figure (2 points). Suppose that this distance is 11/16" (0.6875"). What is the area of the pentagon? (4 points)



$P = 1" \times 5 = 5 in$

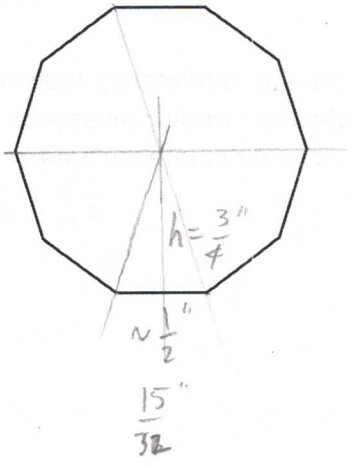
$A = 5A_T = 5 \frac{b \cdot h}{2} = 5 \frac{(1" \cdot \frac{11}{16}")}{2}$

$= 5 \left(\frac{11}{32} in^2\right) = \frac{55}{32} in^2$

$= 1.71875 in^2$

4

7. Use a scale or ruler to measure the sides of the ten-sided figure (decagon), then find the perimeter (2 points). Draw a triangle on the figure that you would use to calculate 1/10 of the area (2 points). Measure the height of the triangle and calculate the area of the decagon (4 bonus points).



$P = 10 \cdot \frac{1}{2}" = 5 in$

$A = 10 \frac{bh}{2} = 10 \frac{\frac{1}{2}" \times \frac{3}{4}"}{2}$

$= 10 \left(\frac{\frac{3}{8} in^2}{2}\right) = 10 \left(\frac{3}{16} in^2\right)$

$= 10 (.1875 in^2) = 1.875 in^2$

4.6875"

$P = \frac{15}{32}" \times 10 = \frac{150}{32}" = 4\frac{11}{16}"$

$.46875 in \times 10 = 4.6875$

$A = 10 \frac{b \cdot h}{2} = 10 \frac{(\frac{15}{32}") \frac{3}{4}}{2}$

$= 10 \frac{\frac{45}{128} in^2}{2}$

$= 10 \left(\frac{45}{256} in^2\right)$

$= 10 (.17578 in^2)$

$= 1.7578 in^2$

22

44 points normalized to 20 (or 40) points

ADJ. 26 MAX