Name: _____

Applied Geometry Perimeter and Area Test 2

1. Find perimeter and area of a circle with radius of 3.5 feet. Show your work (formula and calculations). Make sure to include units. (4 points perimeter; 4 points area)

$$P = \pi 2r = \pi \cdot 2 \cdot 3.5 ft = 21.99 ft$$

$r = 3.5 ft$

$$A = \pi r^2 = \pi (3.5 ft)^2 = \pi \, 12.25 ft^2 = 38.48 ft^2$$

2. Find perimeter and area of a circle with diameter of 14 inches. Show your work (formula and calculations). Make sure to include units. (4 points perimeter; 4 points area)

$$P = \pi d = \pi \, 14 in = 43.98 in$$

$d = 14 in$

$r = \dfrac{d}{2}$

$= \dfrac{14 in}{2} = 7 in$

$$A = \pi r^2 = \pi (7 in)^2 = 153.94 in^2$$

3. Use a scale or ruler to measure the sides (and height) of the figure, then find the perimeter and area. Draw on the figure as necessary to label. (2 points measure; 4 points calculate)

$.0977 in^2$

$r = \dfrac{d}{2}$
$= \dfrac{5}{8} \cdot \dfrac{1}{2}$
$= \dfrac{5}{16} = .3125 in$

2 in

$\dfrac{5}{8} = .625 in$
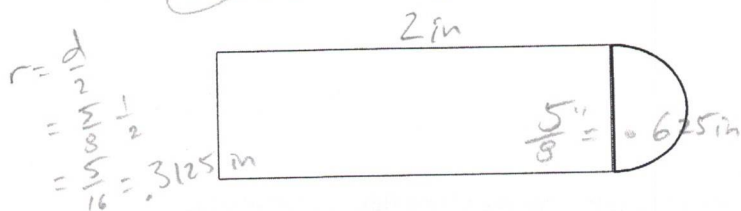
$$A = A_R + \dfrac{A_C}{2}$$
$$= 1.25 in^2 + \dfrac{.3068 in^2}{2}$$
$$.153 + in^2$$
$$= 1.403 in^2$$

$$A_C = \pi r^2$$
$$= \pi (0.3125 in)^2$$
$$= 0.3068 in^2$$

$$A_R = b \cdot h = (2 in)\left(\dfrac{5}{8} in\right)$$
$$= \dfrac{5}{4} in^2 = 1.25 in^2$$

4. You measure a cylinder's diameter to be 4.5 inches and its circumference to be 14.5 inches. What is your approximation of π? (4 points)
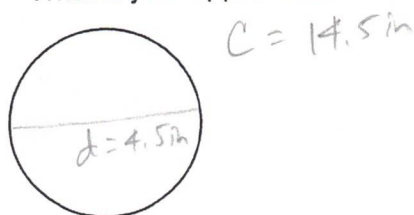
$C = 14.5 in$

$$C = \pi d \Rightarrow \pi = \dfrac{C}{d} = \dfrac{14.5 in}{4.5 in} = 3.222$$

$d = 4.5 in$

5. Use a scale or ruler to measure the necessary parts of the figure, then find the perimeter. Draw on the figure to show what you use as your measurements. (2 points measure; 4 points calculate)

2 in

C_2

3 in

C_1
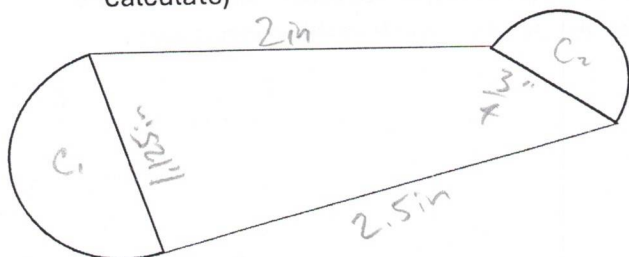
1.125 in

2.5 in

$$P = \dfrac{C_1}{2} + \dfrac{C_2}{2} + 2 in + 2.5 in$$
$$= \dfrac{3.534 in}{2} + \dfrac{2.356 in}{2} + 2 in + 2.5 in$$
$$= 1.767 in + 1.178 in + 2 in + 2.5 in$$
$$= 7.45 in$$

$$C_1 = \pi d_1$$
$$= \pi \, 1.125 in$$
$$= 3.534 in$$

$$C_2 = \pi d_2$$
$$= \pi .75 in$$
$$= 2.356 in$$

60 points normalized to 30

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6. Use a scale or ruler to measure the necessary parts of the figure (the curve is a quarter of a circle), then find its perimeter. Draw on the figure to show what you use as your heights, bases, etc. (8 points)
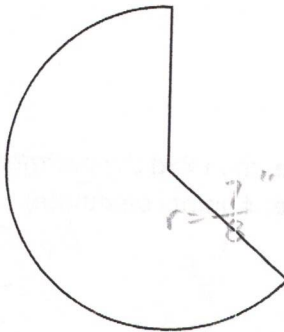
M: 2
C: 6

$1\frac{7}{8}"$

$\frac{5}{8}"$

$r = \frac{5}{8}$

$1.25"$
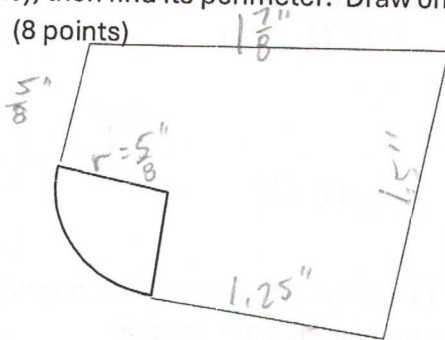
$P = \frac{C}{4} + 1\frac{7}{8}" + \frac{5}{8}" + 1\frac{1}{4}" + 1\frac{1}{2}$

$C = \pi d = \pi \cdot 2 \cdot r$

$= \pi \cdot 2 \cdot .625 \,in$

$= 3.927 \,in$

$P = \frac{3.927 \,in}{4} + 1.875" + .625" + 1.25" + 1.5"$

$= .9817 + 1.875" + .625" + 1.25" + 1.5"$

$= 6.232"$

7. Use a scale or ruler to measure the necessary measurements of the figure (2/3 circle), then find the perimeter. (8 points)

M: 2
C: 6

$r = \frac{7}{8}"$

$P = r + r + \frac{2}{3}C$
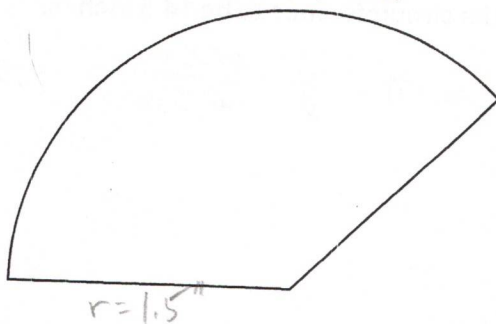
$= 0.875" + 0.875" + \frac{2}{3}(5.498 \,in)$

$= 0.875" + 0.875" + 3.665 \,in$

$P = 5.415 \,in$

$C = \pi \cdot 2 \cdot r$

$= \pi \cdot 2 \cdot .875"$

$= \pi \, 1.75$

$= 5.498 \,in$

8. Use a scale or ruler to measure the sides necessary measurements of the figure (1/3 circle), then find its area. (8 points)

M: 2
C: 6

$r = 1.5"$

$A = \frac{A_C}{3}$

$= \frac{7.069 \,in^2}{3}$

$= 2.356 \,in^2$

$A_C = \pi r^2$

$= \pi (1.5 in)^2$

$= \pi \, 2.25 \,in^2$

$= 7.069 \,in^2$

9. Split the following figure into figures that you could use to find the area. Label the figures and give an equation for the total area. Measure the lines. Construct, label, and measure any lines that you would use to find the area. (4 points + 4 bonus points if you find the correct area)

M: 2
$A_T = \frac{bh}{2}$

T_2

$1.875"$

T_1

$.625$ $5/8$ $.75$

$1.625"$

T_3

$1.25"$ 1.5

$\frac{A_C}{4}$

$1.25"$

T_4
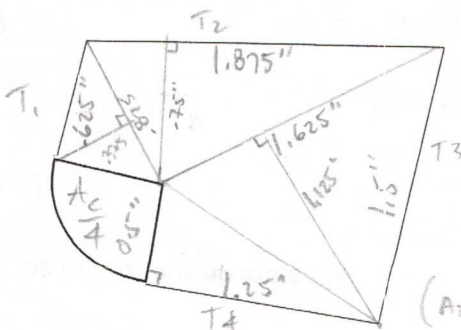
$A = \frac{A_C}{4} + A_{T1} + A_{T2} + A_{T3} + A_{T4}$

$= 0.1963 \,in^2 + 0.164 \,in^2 + 0.703 \,in^2 + 0.914 \,in^2 + 0.3125 \,in^2$

$= 2.2898 \,in^2 \quad (2.2818 \,in^2)$

$A_{T1} = \frac{.875" \cdot .375"}{2}$

$= 0.164 \,in^2$

$A_{T2} = \frac{1.875" \cdot .75"}{2} = 0.703 \,in^2$

$A_{T3} = \frac{1.625" \cdot 1.125"}{2} = 0.914 \,in^2$

$A_{T4} = \frac{1.25" \cdot 0.5 in}{2} = 0.3125 \,in^2$

$\left(A_{T4} = \frac{.5" \cdot .625"}{2} = 0.156 \,in^2 \right)$

$A_C = \pi r^2$

$= \pi (0.5 in)^2$

$= 0.785 \,in^2$

$\frac{A_C}{4} = \frac{0.785 \,in^2}{4}$

$= 0.1963 \,in^2$

60 points normalized to 30