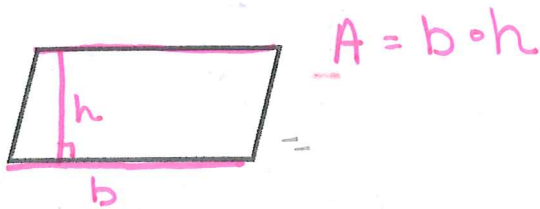


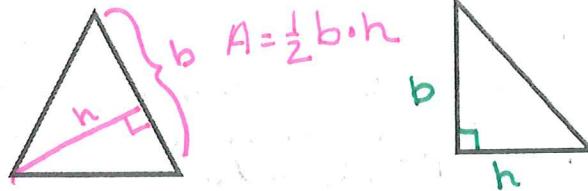
# Introducing Area- Notes

## Deriving Area Formulas

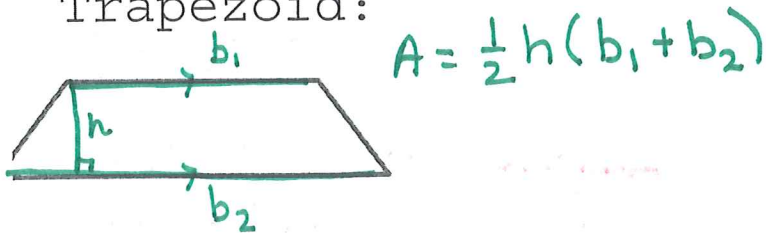
### Parallelogram:



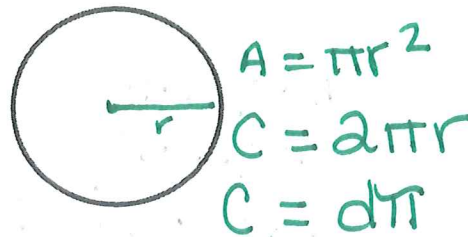
### Triangle:



### Trapezoid:



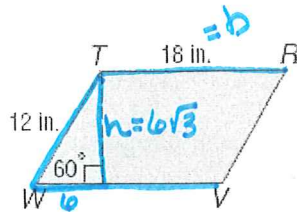
### Circle:



### Examples

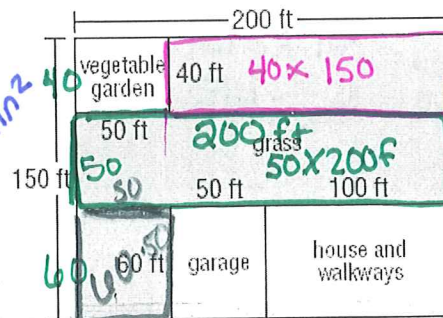
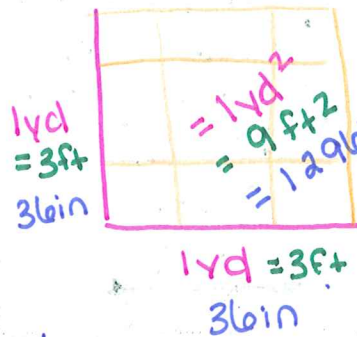
Find the perimeter or circumference and the area of each figure.

1.



$A = b \cdot h$   
 $A = 18 \cdot 6\sqrt{3}$   
 $A = 108\sqrt{3} \text{ in}^2$

2. George's family want to sod a portion of their yard. Find the number of square yards of grass needed to sod the yard (the shaded region).

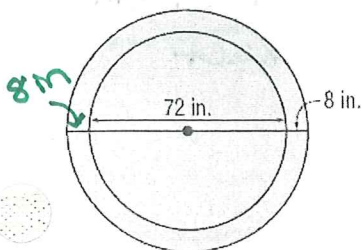


$40 \times 150$   
 $+ 50 \times 200$   
 $60 \times 50$

Total area is  $19,000 \text{ ft}^2$

Convert  $\text{ft}^2 \div 9$   
 $A = 2,111.11 \text{ yd}^2$

3. An outdoor accessories company manufactures circular covers for outdoor umbrellas. If the cover is 8 inches longer than the umbrella on each side, find the area of the cover in square yards.



$d = 88 \text{ in}$   
 $r = 44 \text{ in}$

$A = \pi r^2$   
 $A = \pi 44^2$   
 $A = 1936\pi \text{ in}^2 \leftarrow \text{exact}$   
 $= 6,082.12 \text{ in}^2$

Convert to  $\text{yd}^2$   
 $\div 1296$

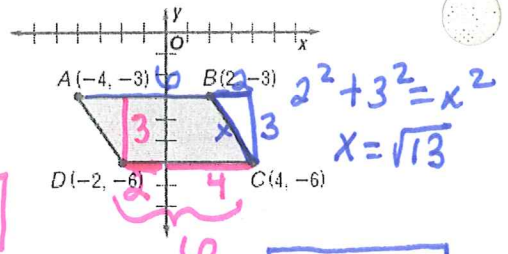
$A \approx 4.7 \text{ yd}^2$

3 COORDINATE GEOMETRY The vertices of a quadrilateral are  $A(-4, -3)$ ,  $B(2, -3)$ ,  $C(4, -6)$ , and  $D(-2, -6)$ .

Determine if it is a square, rectangle or parallelogram, then find the area.

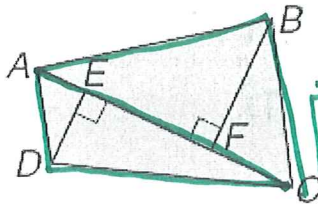
Slope  $AB = 0$  Parallelogram  
 Slope  $AD = -\frac{3}{2}$  because  $AB \parallel CD$   
 Slope  $CD = 0$  on  $AD \parallel BC$   
 Slope  $BC = -\frac{3}{2}$  NO Right  $\angle$ s.

$A = b \cdot h$   
 $A = 6 \cdot 3$   
 $A = 18 \text{ unit}^2$



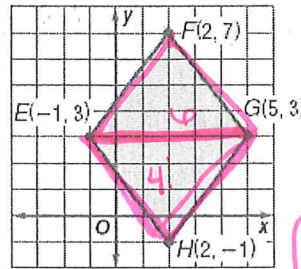
$P = 6 + \sqrt{13} + 6 + \sqrt{13}$   
 $P = 12 + 2\sqrt{13} \text{ units}$

4. Find the area of quadrilateral  $ABCD$  if  $AC = 35$ ,  $BF = 18$ , and  $DE = 10$ .



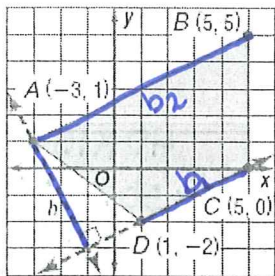
$A = \frac{1}{2} 35 \cdot 18$   
 $+ \frac{1}{2} 35 \cdot 10$   
 $A = 490 \text{ units}^2$

5. Find the area



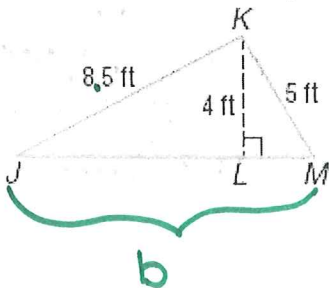
$A = 2 \left( \frac{1}{2} b \cdot h \right)$   
 $A = 2 \left( \frac{1}{2} 6 \cdot 4 \right)$   
 $A = 24 \text{ units}^2$

6. COORDINATE GEOMETRY Find the area of trapezoid  $ABCD$  with vertices  $A(-3, 1)$ ,  $B(5, 5)$ ,  $C(5, 0)$ , and  $D(1, -2)$ .

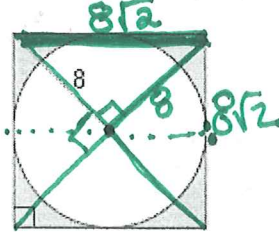


$A = \frac{1}{2} h (b_1 + b_2)$   
 $h = 2\sqrt{5}$   
 $b_1 = 2\sqrt{5}$   
 $b_2 = 4\sqrt{5}$   
 $A = \frac{1}{2} 2\sqrt{5} (2\sqrt{5} + 4\sqrt{5})$   
 $A = \frac{1}{2} 2\sqrt{5} (6\sqrt{5})$   
 $= 6\sqrt{25}$   
 $= 6 \cdot 5$   
 $A = 30 \text{ units}^2$

7. Find the area of  $\triangle JKM$ .



8. Find the shaded area.



$8\sqrt{2}$   
 $8\sqrt{2} \cdot 8\sqrt{2} - \pi (4\sqrt{2})^2$   
 $64 \cdot 2 - 16 \cdot 2\pi$   
 $64 \cdot 2 - 32\pi$   
 $A = 128 - 32\pi \text{ units}^2$   
 exact

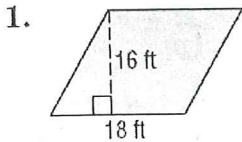
9.  $A = \pi R^2 - \pi r^2$   
 $\pi 4^2 - \pi 2^2$   
 $16\pi - 4\pi$   
 $A = 12\pi \text{ in}^2$

10.  $A = \pi 8^2 - 2(\pi 4^2)$   
 $= 64\pi - 32\pi$   
 $= 32\pi \text{ m}^2$

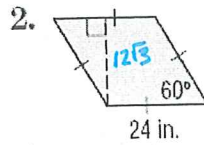


Individual Practice-Intro to Area

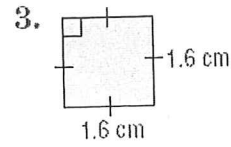
Find the area of each parallelogram.



$A = 18 \cdot 16$   
 $A = 288 \text{ ft}^2$



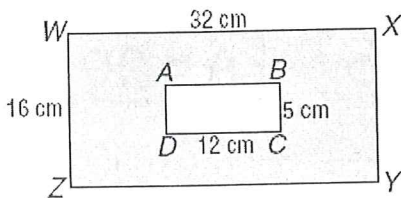
$A = 24 \cdot 12\sqrt{3}$   
 $A = 288\sqrt{3} \text{ in}^2$



$A = 2.56 \text{ cm}^2$

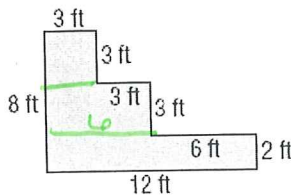
Find the area of each shaded region.

4. WXYZ and ABCD are rectangles.



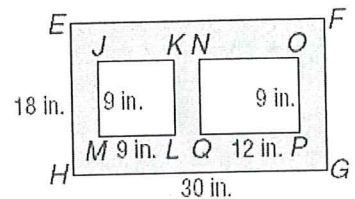
$A = \text{rectangle} - \text{rectangle}$   
 $A = 16 \cdot 32 - 12 \cdot 5$   
 $512 - 60$   
 $A = 452 \text{ cm}^2$

5. All angles are right angles.



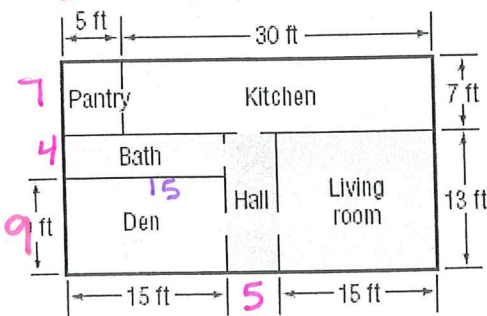
$3 \times 3 + 6 \times 3 + 12 \times 2$   
 $A = 51 \text{ ft}^2$

6. EFGH and NOPQ are rectangles; JKLM is a square.



$18 \times 30 - 9 \times 9 - 12 \times 9$   
 $A = 351 \text{ in}^2$

7. The Smiths are planning to carpet part of their house. The carpet they plan to buy is sold by the square foot. If the carpet costs \$4 per square foot. Find the cost of the carpeting if they want to carpet the living room, den, and hall. They want to tile the bathroom and kitchen floor. The tile is 1ft x 1ft and costs \$6.75 per tile. What is the cost to tile that area?



Living Room  
 $13 \times 15 = 195 \text{ ft}^2$

Den  
 $9 \times 5 = 45 \text{ ft}^2$

Hall  
 $5 \times 13 = 65 \text{ ft}^2$

Total Area for Carpet: 305 ft<sup>2</sup>

at a cost of \$4.00  
 Per square foot  
 = \$1580.00 before  
 taxes

Bathroom  
 $4 \times 5 = 20 \text{ ft}^2$

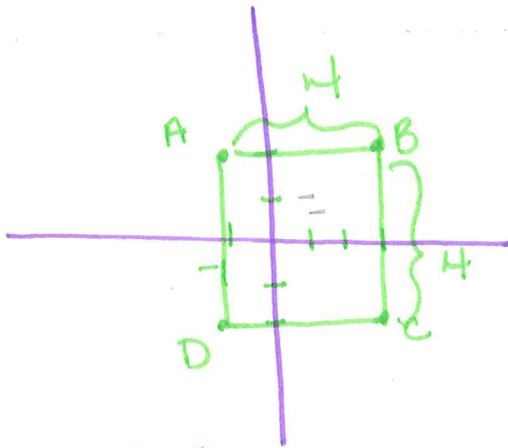
Kitchen  
 $7 \times 30 = 210 \text{ ft}^2$

Total area for Tile: 230 ft<sup>2</sup>

at cost of \$6.75  
 Tile costs \$1822.50

Find the area of each figure (round to the nearest tenth).

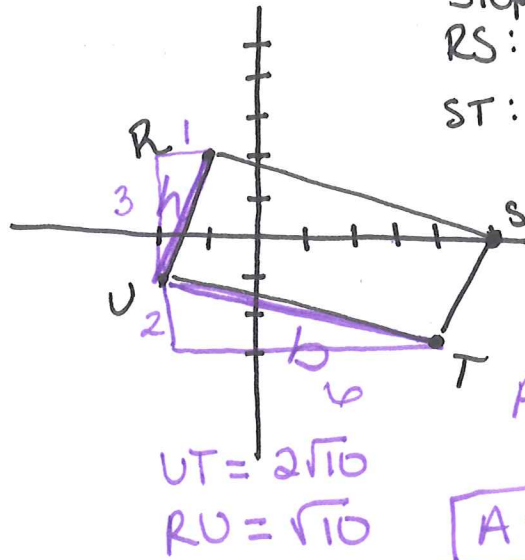
8.  $A(-1, 2)$ ,  $B(3, 2)$ ,  $C(3, -2)$ , and  $D(-1, -2)$       9.  $R(-1, 2)$ ,  $S(5, 0)$ ,  $T(4, -3)$ , and  $U(-2, -1)$



$$A = b \cdot h$$

$$A = 4 \cdot 4$$

$$A = 16 \text{ units}^2$$



Slopes

$$RS: \frac{-2}{6} = -\frac{1}{3}$$

$$ST: \frac{3}{3} = 1$$

⊥

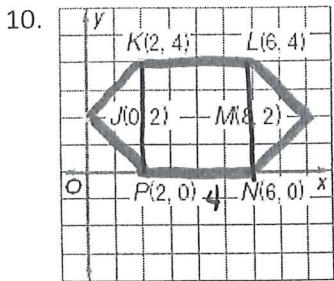
∴ Rectangle

$$A = b \cdot h$$

$$A = 2\sqrt{10} \cdot \sqrt{10}$$

$$= 2 \cdot 10$$

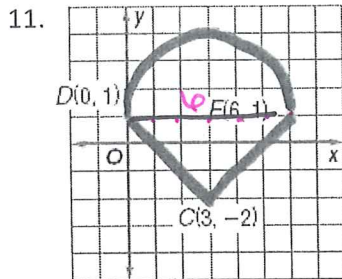
$$A = 20 \text{ units}^2$$



$$2 \Delta + \square$$

$$2\left(\frac{1}{2} \cdot 4 \cdot 2\right) + 4 \times 4$$

$$A = 24 \text{ units}^2$$



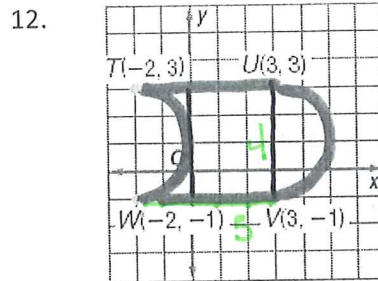
$$\frac{1}{2} \square + \Delta$$

$$\frac{1}{2} \pi 3^2 + \frac{1}{2} 6 \times 3$$

$$4.5\pi + 9$$

$$A = 9 + 4.5\pi \text{ units}^2$$

Exact



$$\square - \frac{1}{2} \square + \frac{1}{2} \square$$

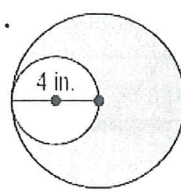
$$5 \times 4 - \frac{1}{2} \pi 2^2 + \frac{1}{2} \pi 2^2$$

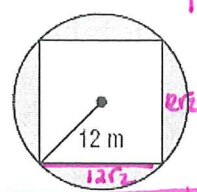
$$A = 20 \text{ units}^2$$

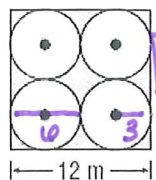
Name: Key Date: \_\_\_\_\_

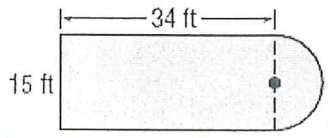
Find ACC Geometry: Homework Intro to Area

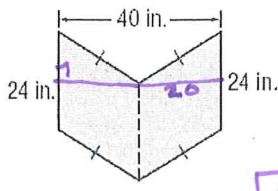
the area of the shaded regions.

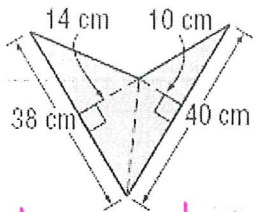
1.   $\pi 4^2 - \pi 2^2$   
 $16\pi - 4\pi$   
 $= 12\pi \text{ in}^2$

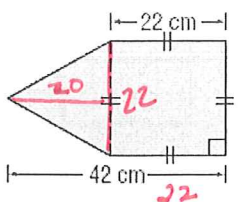
2.   $\pi 12^2 - 12 \cdot 12$   
 $A = (144\pi - 288)$

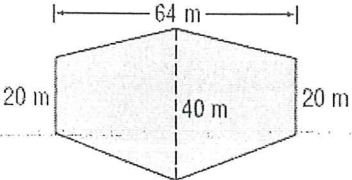
3.   $12 \times 12 - 4(\pi 3^2)$   
 $144 - 36\pi \text{ m}^2$

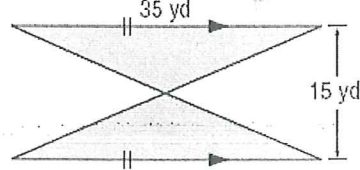
4.   $15 \times 34 + \frac{1}{2} \pi (7.5)^2$   
 $A = 510 + 28.125\pi \text{ ft}^2$

5.   $A = 2(b \cdot h)$   
 $A = 2(24 \cdot 20)$   
 $A = 960 \text{ in}^2$

6.   $A = \frac{1}{2} 38 \cdot 14 + \frac{1}{2} 40 \cdot 10$   
 $A = 466 \text{ cm}^2$

7.   $A = \frac{1}{2} 22 \cdot 20 + 22 \cdot 22$   
 $A = 704 \text{ cm}^2$

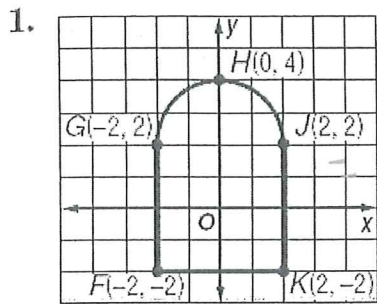
8.   $A = 1920 \text{ m}^2$

9.   $A = 262.5 \text{ yd}^2$

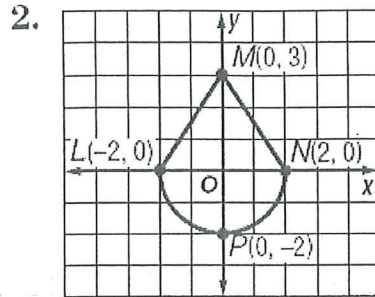


# Areas of Composite Figures

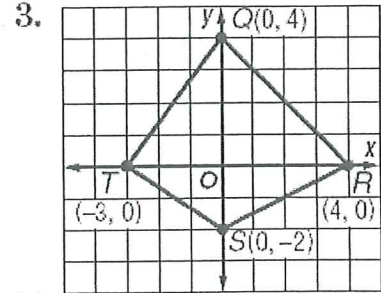
Find the area of each figure. Round to the nearest tenth.



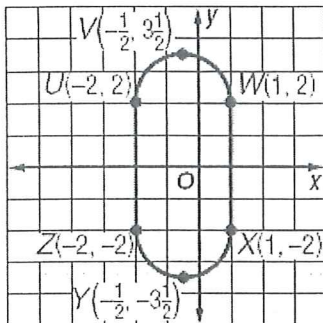
$22.3 \text{ units}^2$



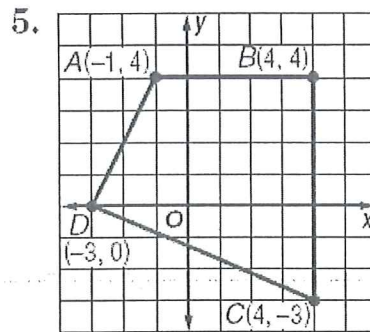
$A = 12.3 \text{ units}^2$



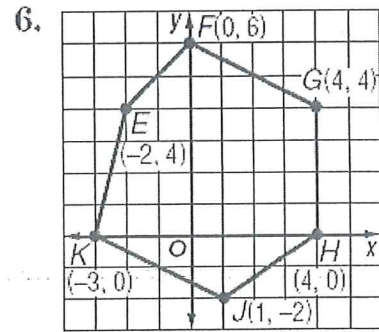
$A = 21 \text{ units}^2$



$A = 19.1 \text{ units}^2$

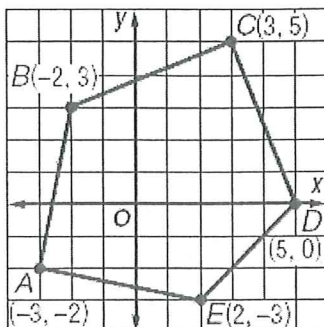


$A = 34.5 \text{ units}^2$



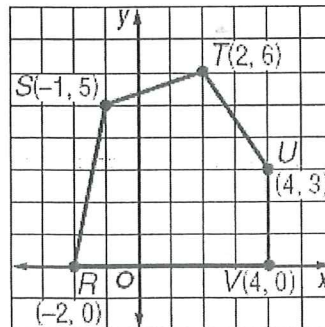
$A = 39 \text{ units}^2$

7. pentagon  $ABCDE$



$A = 42.5 \text{ units}^2$

8. pentagon  $RSTUV$



$A = 28 \text{ units}^2$