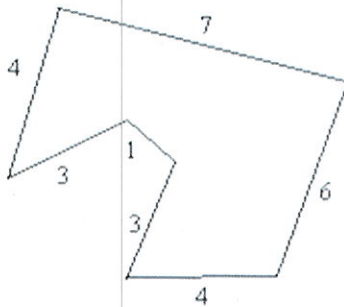
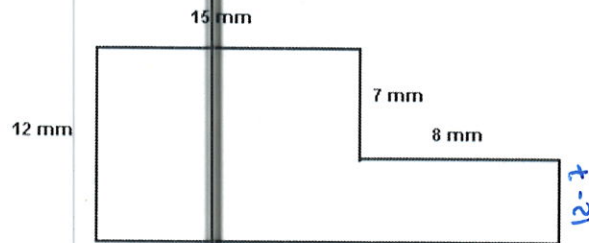


**Instructions:** Work problems on a separate sheet of paper and attach work to this page. You should show all work to receive full credit for problems. Checking your work with computer algebra systems is fine, but that doesn't count as "work" since you won't be able to use CAS programs on exams or quizzes. Sketch any graphs you obtain. Questions with compact answers can be recorded directly on this page. Graphs and longer answers that won't fit here, indicate which page of the work the answer can be found on and be sure to clearly indicate it on the attached pages.

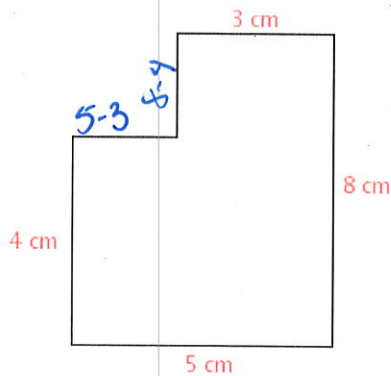
1. Find the perimeter of the following shapes.



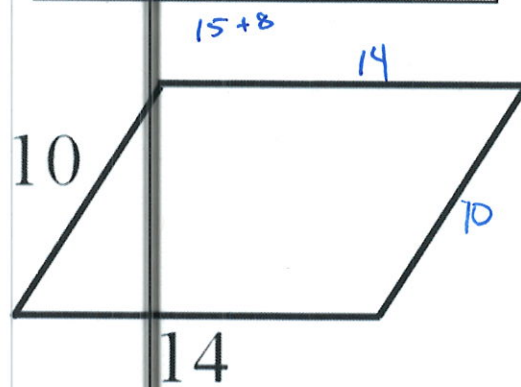
a.



c.

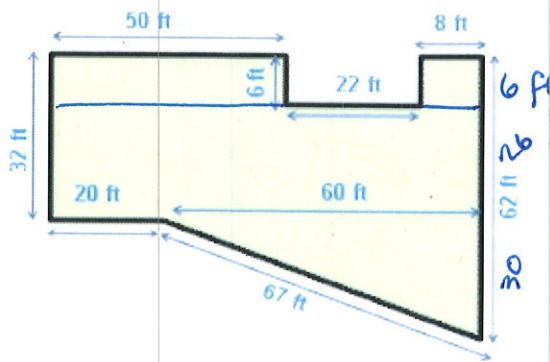


b.

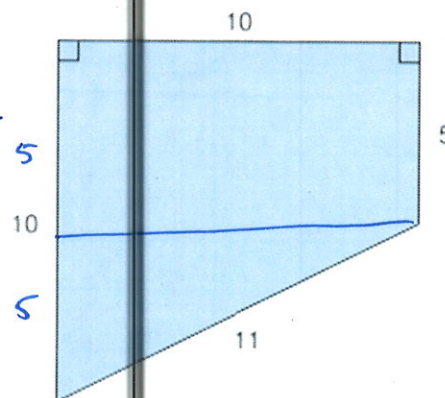


d.

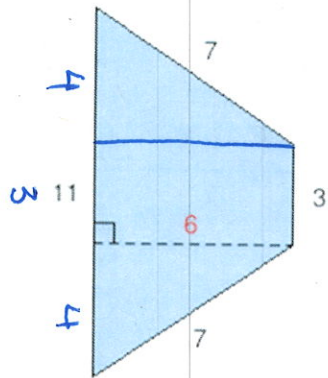
2. Find the area of the following regions.



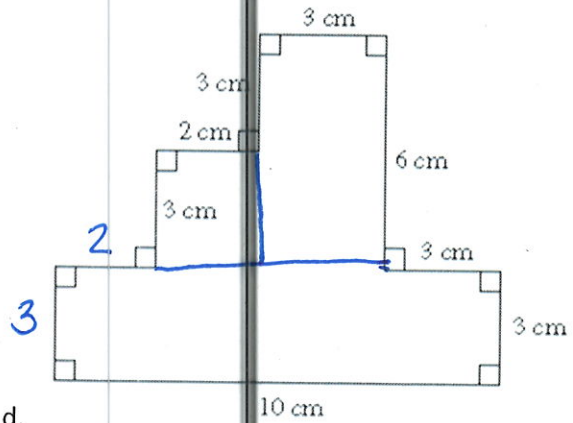
a.



c.

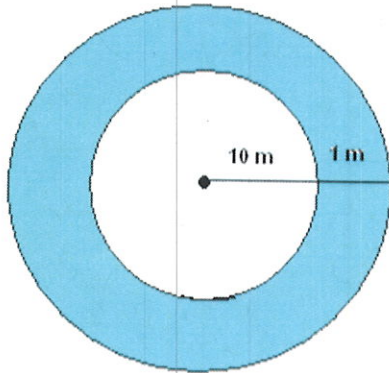


b.



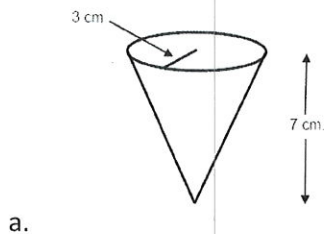
d.

3. Find the area of the shaded region.

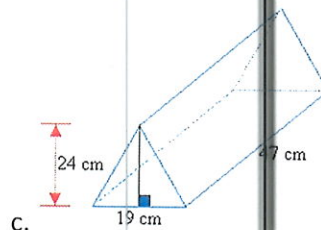


4. A ceiling measuring  $9 \times 15 \text{ ft}^2$  can be painted for \$60. How much would it cost to paint a ceiling  $18 \times 30 \text{ ft}^2$ .

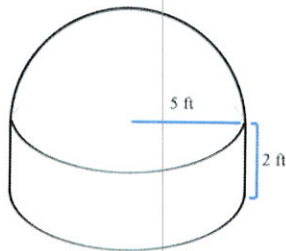
5. Find the volume of the given shapes.



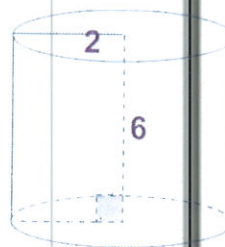
a.



c.



b.



d.

1a.  $4+7+6+4+3+1+3 = 28$

c.  $12+15+7+8+(8+15)+(12-7) = 70$

b.  $4+5+8+3+4+2 = 26$   
 $(8-4) (5-3)$

d.  $10+14+10+14 = 48$

2a.  $50 \times 6 + 8 \times 6 + 26 \times 80 + 60 \times 30 \times \frac{1}{2} = 3328$

c.  $10 \times 5 + \frac{1}{2}(5)(10) = 75$

b.  $4 \times 6 \times \frac{1}{2} + 4 \times 6 \times \frac{1}{2} + 6 \times 3 = 42$

or  $\frac{1}{2}(11+3) \cdot 6 = 42$

d.  $3 \times 10 + 2 \times 3 + 3 \times 6 = 54$

3.  $\pi(11)^2 - \pi(10)^2 = 121\pi - 100\pi = 21\pi$

4.  $\frac{9 \times 15}{60} = \frac{18 \times 30}{x} \Rightarrow 135x = 324,000$   
 $x = 240$

5. a.  $V = \frac{1}{3}\pi r^2 h = \frac{1}{3}\pi (3)^2 \cdot 7 = 21\pi$

b.  $\frac{1}{2}(\frac{4}{3}\pi(5)^3) + \pi(5)^2 \cdot 2 = \frac{250}{3}\pi + 50\pi = \frac{400}{3}\pi$

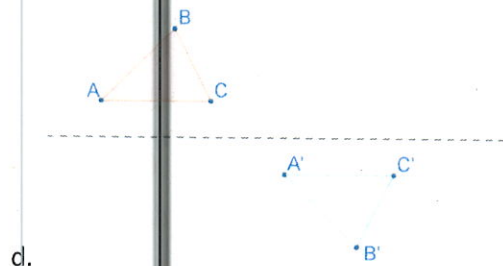
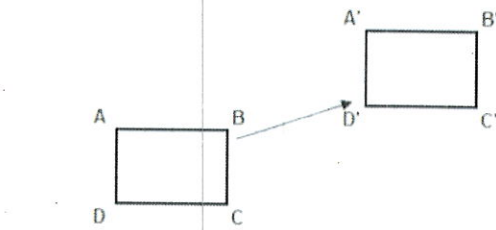
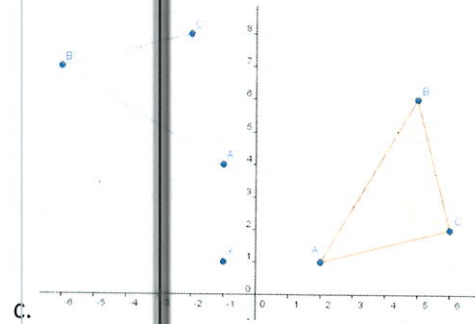
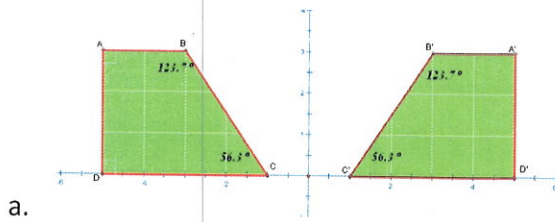
c.  $\frac{1}{2}(24)(19)(47) = 10,716$

d.  $\pi(2)^2(6) = 24\pi$

6. a. reflection  
 b. translation

c. rotation  
 d. glide reflection

6. Identify each rigid motion.



7. Identify the symmetry of the shapes below.

Lines of Symmetry: <u>5</u>	Lines of Symmetry: <u>0</u>	Lines of Symmetry: <u>0</u>
Rotational Symmetry: <u>5</u>	Rotational Symmetry: <u>4</u>	Rotational Symmetry: <u>1</u> (360°)

8. Describe three ways that Euclidean and non-Euclidean geometry can differ.

9. Starting with an equilateral triangle, build three steps of a Koch snowflake.

10. Draw 4 stages of a Sierpinski Gasket.

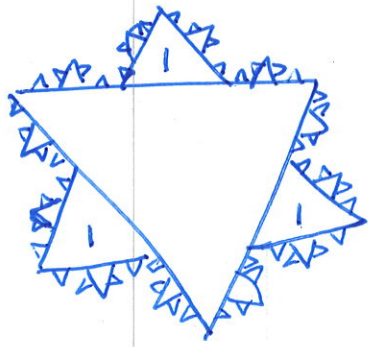
11. Find an example of a 2D or 3D fractal online (not Koch Snowflake or Sierpinski Gasket).

12. Describe "self-similarity" and how it applies to fractals.

8. answers may vary :

parallel lines may diverge or intersect  
triangles more/less than  $180^\circ$   
each pt. 3 line intersect uniquely

9.



10.



11. answers will vary

12. Self-similarity refers to a property of fractals wherein as one zooms in on the fractal it has a similar appearance at every level of zoom.