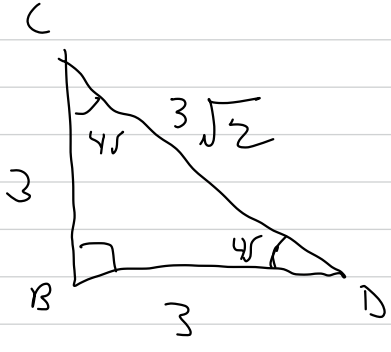
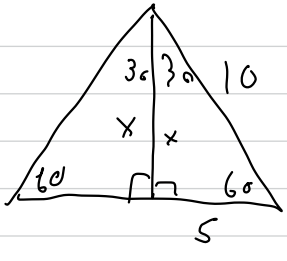
Geometry Test 2 Solns

1. SSS all 3 sides equal
   SAS two sides and the angle between equal
   AAS two angles and a side equal.

2.



3.



$5^2 + x^2 = 10^2$

$25 + x^2 = 100$

$x^2 = 75$

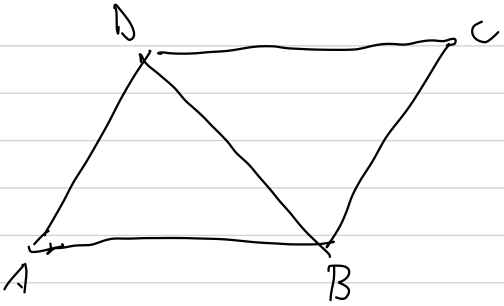
$x = \sqrt{75} = 5\sqrt{3}$

base $= 10$ height $= 5\sqrt{3}$

Area $= \frac{1}{2}$ base $\times$ height $= \frac{1}{2} 10 \cdot 5\sqrt{3} = \boxed{25\sqrt{3}}$

Geometry Test 2 Solns

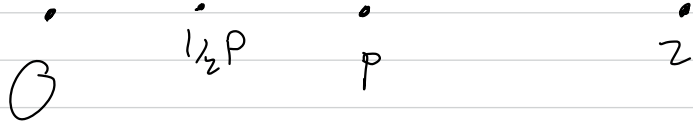
4.



- $\angle A = \angle C$ because opposite angles of a parallelogram are equal
- The triangles share the side DB
- $\angle ADB = \angle CBD$ because opposite angles of parallel lines have same measure

By AAS the triangles $\triangle ADB$ and $\triangle CBD$ are congruent

5.



Geometry Test 2 Solns

6. Triangles are similar iff a dilation of one is congruent to the other.

7. a) If all angles are equal
   b) If corresponding sides have the same ratio for all sides.

8. The smaller triangle is $\frac{1}{3}$ the size of the bigger.

   a) So $|GH|$ is $\frac{1}{3}$ of $|DF| = 8$

   that is $|GH| = \frac{1}{3} \cdot 8 = \frac{8}{3}$

   b) $\triangle EGH$ is similar to $\triangle EDF$

   c) Because their corresponding angles are equal
      i) They share $\angle E$

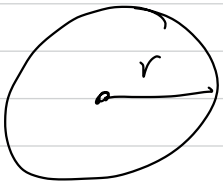
      ii) $m\angle EGH = m\angle EDF$ because corresponding sides of a line intersecting parallel lines $\overline{GH}$, $\overline{DF}$

      iii) $m\angle EHG = m\angle EFD$ because corresponding sides of a line intersecting parallel lines $\overline{GH}$, $\overline{DF}$

9. Dilation by a factor of r multiplies each coordinate by r.

10. Angles are unchanged by dilation

11.



$$A = \pi r^2 \qquad = 36\pi$$

$$\frac{}{\pi} \qquad \frac{}{\pi}$$

$$r^2 = 36$$

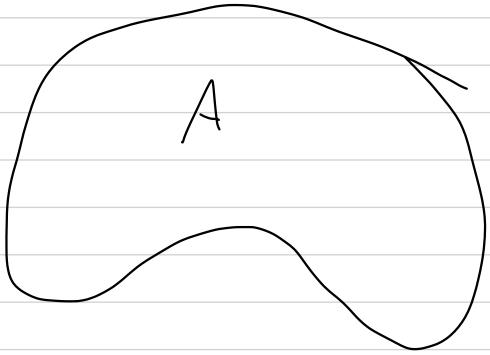
$$r = 6$$

Circumference $= 2\pi r$

$= 2\pi \cdot 6$

$= \boxed{12\pi}$

12.



Area is 16

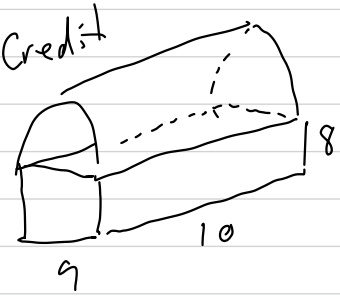
$D_3(A)$ dilation by 3

Area is $3^2 \cdot A$

$= 9 \cdot 16$

$= 144$

13. Extra Credit



a) Roof area = (1/2 circum of diameter 9 circle) × 10

$= 4.5\pi \cdot 10 = 45\pi$

b) 4 rectangle sides area = $9 \times 8 + 10 \times 8 + 9 \times 8 + 10 \times 8$

$= 144 + 160 = 304$

2 semi circles on the side add to one circle of radius 4.5 Area = $\pi r^2 = \pi (4.5)^2 = 20.25\pi$

Total = 4 rectangle sides + 2 semi circles + roof

$= 304 + 20.25\pi + 45\pi$

$= 304 + 65.25\pi$