

## **Geometry Assessment (January 31, 2012)**

*Note: You may write surface area and volume formulas on a notecard.*

### **Pythagorean Triples**

- State examples of Pythagorean Triples. *Shortcut: where  $n > 1$ :  $n^2 - 1$ ,  $2n$ ,  $n^2 + 1$  will generate sets of Pythagorean Triples.*
- Solve problems that involve Pythagorean Triples.

### **Surface Area/Volume**

- Explain why the formula for surface area of a cylinder makes sense.
- Solve problems that involve surface area of prisms and cylinders.
- Compare and contrast prisms and pyramids. What is a tetrahedron?
- Explain the difference between the height and slant height of pyramid.
- Solve problems that involve surface area of pyramids and cones.
- Solve problems that involve the volume of prisms and cylinders.

### **Special Right Triangles**

- Solve problems that involve special right triangles 30-60-90 and 45-45-90.

### **Transformations**

- What is a transformation?
- Describe what an isometry is.

#### **Reflection:**

1. What do we need to perform a reflection?
2. Is reflection an isometry? Why or why not?
3. What are the properties of reflection?
4. Be able to find the image after reflecting a figure over a given reflection line.  
(P 636: 1, 3, 9, 11, 13, 15, 37, 41)

#### **Translation:**

1. What are the two things we need to perform a translation?

2. Is translation an isometry?
  3. What is a vector? Here is a vector,  $\langle 4, -2 \rangle$ , what does 4 tell you? What does -2 tell you?
  4. What does it mean if we maps each point  $(x, y)$  to  $(x+a, y+b)$ ?
  5. Be able to find the image after translating a figure when given a vector,  $\langle a, b \rangle$ , or  $(x, y) \rightarrow (x+a, y+b)$ .
- (P643: 3, 17, 19, 21, 23, 25, 33, 58)

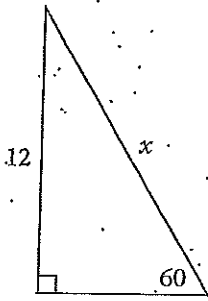
**Rotation:**

1. What are the three things we need to know to perform a rotation?
  2. Is rotation an isometry? Why or why not?
  3. A point and its image are \_\_\_\_\_ to the rotation point. So, a rotation preserves the \_\_\_\_\_.
  4. Be able to perform the rotation and find the image when given the center, the angle, and the direction of a rotation.
- (P649: 1, 7, 11, 13, 15, 17, 39)

**Dilation:**

1. What are the two things we need to perform a dilation?
  2. Is dilation an isometry?
  3. The image of a dilation is \_\_\_\_\_ (similar/congruent) to the preimage.
  4. The scale factor is the ratio of the size of the \_\_\_\_\_ (image/preimage) to the size of the \_\_\_\_\_ (image/preimage).
  5. When the scale factor is greater than 1, the image is \_\_\_\_\_ (enlarged/reduced); when the scale factor is between 0 and 1, the image is \_\_\_\_\_ (enlarged/reduced); When the scale factor is 1, the image is \_\_\_\_\_ to the preimage.
  6. Be able to perform the dilation and find the image when given the center and the scale factor.
- (P676: 1-9, 37, 39, 43, 39)

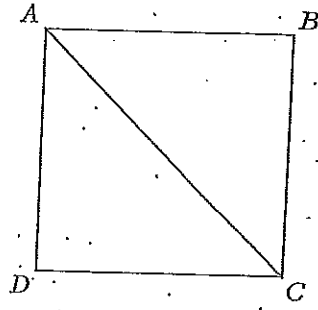
7.



In the figure above, what is the measure of  $x$ ?

- (A)  $6\sqrt{2}$
- (B) 12
- (C)  $8\sqrt{2}$
- (D)  $8\sqrt{3}$
- (E) 14

10.



In square  $ABCD$  shown above, if  $AC = 5$ , what is the area of the shaded region?

11.

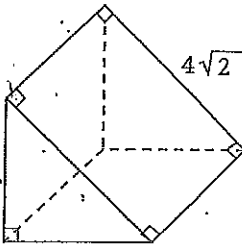
A rectangular block with a volume of 250 cubic inches was sliced into 2 cubes of equal volume. How much greater, in square inches, is the combined surface area of the 2 cubes than the original surface area of the rectangular block?

A cylinder has a volume of  $72\pi$  cubic inches and a height of 8 inches. If the height is increased by 4 inches, what will be the new volume of the cylinder, in cubic inches?

- (A)  $576\pi$
- (B)  $9\pi$
- (C)  $108\pi$
- (D)  $328\pi$
- (E)  $76\pi$

12.

If a right cylinder with a radius of 2 has a volume of  $100\pi$ , what is the height of the cylinder?



If the solid above is half of a cube, then the volume of the solid is

- (A) 16
- (B) 32
- (C) 42
- (D) 64
- (E)  $64\sqrt{2}$