

## Exam Review #1    TRANSFORMATIONS

1. Always start with the Pre-Image points in the left column. Write the coordinates of the image points under the three transformations in part A, B and C. If necessary, you may plot the pre-image points on a coordinate grid to help you determine the image points.

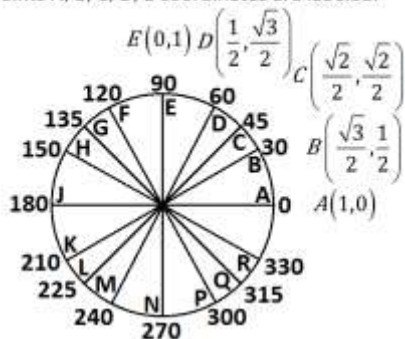
Pre-image points	A. Image points under reflection in X-axis	B. Image points under reflection in Y-axis	C. Image points under reflection in line Y = X
P(-4, 5)	P'( ?, ? )	P'( ?, ? )	P'( ?, ? )
Q( 1, 7)	Q'( ?, ? )	Q'( ?, ? )	Q'( ?, ? )
R(-2, -3)	R'( ?, ? )	R'( ?, ? )	R'( ?, ? )
S( 6, -8)	S'( ?, ? )	S'( ?, ? )	S'( ?, ? )
T ( x, y )	T'( ?, ? )	T'( ?, ? )	T'( ?, ? )

## Exam Review #1    TRANSFORMATIONS

2. Use the diagram to write the coordinates of the image points under the specified rotations in part A, B, C and D.

**CCW = counter clockwise**

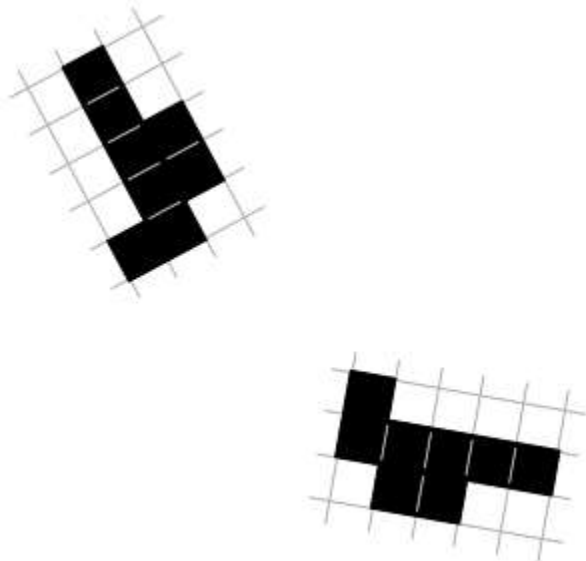
This is a UNIT circle. It has radius = 1 unit.  
Points A, B, C, D, E coordinates are labeled.



Pre-image points  See circle above	A. Image points under rotation by 90°	B. Image points under rotation by 180°	C. Image points under rotation by 60°	D. Image points under rotation by 120°
Point A	A'( ?, ? )	A'( ?, ? )	A'( ?, ? )	A'( ?, ? )
Point B	B'( ?, ? )	B'( ?, ? )	B'( ?, ? )	B'( ?, ? )
Point C	C'( ?, ? )	C'( ?, ? )		
Point D	D'( ?, ? )	D'( ?, ? )	D'( ?, ? )	D'( ?, ? )

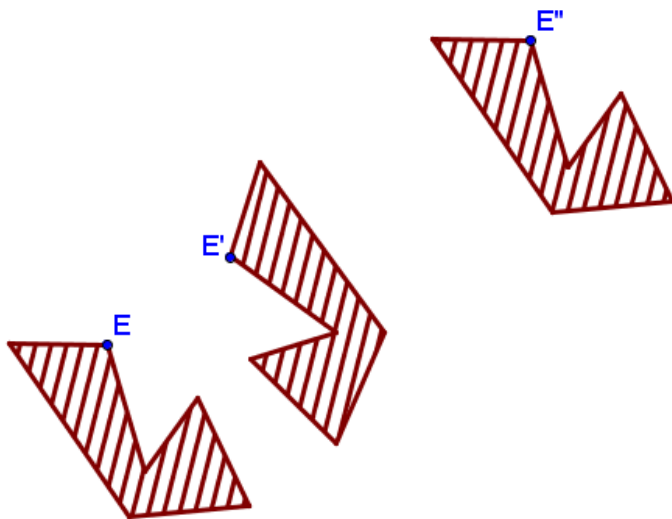
Do BEFORE ..... you Glue!!!!!!  
Exam Review #1 TRANSFORMATIONS

3. Find the center of rotation & label it P. Use a protractor to measure the angle of rotation that maps the pre-image onto the image.



Do BEFORE ..... you Glue!!!!!!  
Exam Review #1 TRANSFORMATIONS

4. Find the two lines of reflection that map the pre-image E to the first image E' and the first image E' to the second image E''. What is the distance between the two lines of reflection? What is the distance between E and E''? What is the relationship between these two distances?



## LINEAR EQUATIONS & GRAPHS

### Exam Review #2

1 A bug is moving along a coordinate grid and its location given by the  $(x, y)$  points in each table.

For each bug's table values:

A. Graph the **line** (including arrows) containing the two points.

B. Describe how  $x$ -values change as time values for  $T$  increase by 1?

C. Describe how  $y$ -values change as time values for  $T$  increase by 1?

D. Where will the bug be at time 2?

E. Write the equation of the bug's  $(x, y)$  path using an equation in **point-slope** form:  $y = m(x - h) + k$

Bug 1

T	0	1	2
X	1	5	
Y	4	2	

Bug 2

T	0	1	2
X	-5	-2	
Y	-3	3	

2 Graph all four lines on the same coordinate plane. Label axes with variable and scale.

A.  $y = \frac{3}{2}(x + 1) - 4$

B.  $x = -7$

C.  $y = -4$

D.  $y = \frac{-2}{3}(x - 2) + 1$

What do you know about the relationship between  
...line A and line D?  
...line B and line C?

## LINEAR EQUATIONS & GRAPHS

### Exam Review #2

3

A. Graph SEGMENT  $\overline{AB}$  containing the two points  $A(4, -1)$  &  $B(-3, 3)$

B. Graph the LINE that is **parallel** to  $\overline{AB}$  and passes through  $(-4, -3)$ .

C. Write the **equation** of this parallel line in point-slope form:

$$y = m(x - h) + k$$

4

A. Graph SEGMENT  $\overline{CD}$  containing the two points  $C(-3, 6)$  &  $D(5, -2)$

B. Graph the LINE that is **perpendicular** to  $\overline{CD}$  and passes through the **midpoint** of  $\overline{CD}$ .

C. Write the equation of this perpendicular line in point slope form:

$$y = m(x - h) + k$$

## TRANSFORMATIONS OF FUNCTIONS

### Exam Review #2

#### 5 Transformations of Functions Notation:

Given the pre-image function  $f(x)$ , describe the transformations that have occurred to  $f(x)$  in order to produce the new image functions  $g(x)$ ,  $h(x)$ ,  $j(x)$  and  $k(x)$ . Your description should indicate a horizontal shift, what direction (left/right) and how far, and a vertical shift, what direction (up/down) and how far.

A  $g(x) = f(x - 5) - 8$

B  $h(x) = f(x + 7) - 2$

C  $j(x) = f(x - 9) + 3$

D  $k(x) = f(x + 4) + 6$

#### 6 Function Notation: $f(x) = 3(x) - 4$

For the answer to A state a numerical value

A  $f(5) =$

For the answer to B, C, & D state a variable expression.

B  $f(x) + 7 =$

C  $f(\square - 1) =$

D  $m(x) = x^2$ ,  $f(m(x)) =$

For the answer to E, what value of  $x$  results in

E  $f(x) = 17$

## COORDINATE GEOMETRY

### Exam Review #3

1 Given the endpoints of each segment:

- Find the midpoint of each segment.
- Find the slope of each segment.
- Find the distance of each segment and leave the answer in **simplified radical form**.

A.  $(1,7) \& (5,11)$

B.  $(-3,2) \& (7,-12)$

2 Match the constructions #1-4 with the points of concurrency A-D.

The Point of Concurrency or Center of the triangle called the

- A Orthocenter
- B Incenter
- C Circumcenter
- D Centroid

... is formed by the which construction?

Match the constructions below with the centers above:

- 1 angle bisectors
- 2 medians
- 3 altitudes
- 4 perpendicular bisectors

COORDINATE GEOMETRY	
Exam Review #3	
<p>3 The point <math>(0,0)</math> is the center of a circle with radius 5 units. The circle is inscribed in a triangle and therefore <math>(0,0)</math> is the INCENTER of a triangle. The three sides of the triangle are tangent to the circle at these points:  <math>(4,3), (3,-4)</math> &amp; <math>(-5,0)</math>.  <b>Use grid X[-10,10] Y[-12,18]</b>            Locate the three lattice point vertices of the triangle.            Graphically verify the coordinates.</p>	<p>4 <math>\triangle PQR</math> with vertices <math>P(-3, -2)</math>, <math>Q(1,6)</math>, <math>R(6,1)</math>            A. Plot the vertices and draw the triangle on the coordinate plane.  <b>Use grid X[-5,10] Y[-5,10]</b>            B. Determine the slope of each side of the triangle.            C. Draw the <b>altitudes</b> from each vertex to the opposite side. What is true about the slope of each altitude to the side of the triangle slopes?            D. State the coordinate point and the name of the intersection of the altitudes?</p>

COORDINATE GEOMETRY	
Exam Review #3	
<p>5 <math>\triangle ABC</math> with vertices <math>A(-3, -5)</math>, <math>B(-1,13)</math>, <math>C(13,7)</math>            A. Plot the vertices and draw the triangle on the coordinate plane.  <b>Use grid X[-5,15] Y[-5,15]</b>            B. Locate the midpoints of each side of the triangle            C. Draw the three <b>medians</b> of the triangle.            D. Locate the CENTROID and state its <math>(x, y)</math> coordinate.            E. Use the distance formula to find the length of the median from vertex A in <b>simplified radical form</b>.            F. For the median from vertex A, find the length of each part (from centroid to A and from centroid to the midpoint). Verify the relationship between two parts &amp; the median length</p>	<p>6 <math>\triangle JKL</math> with vertices <math>J(2,1)</math>, <math>K(10,-1)</math>, <math>L(6,11)</math>            A. Plot the vertices and draw the triangle on the coordinate plane.  <b>Use grid X[-2,14] Y[-4,14]</b>            B. Find the midpoints of each side of the triangle.            C. Find the slope of each side of the triangle.            D. Construct the <b>perpendicular bisectors</b> of each side of the triangle.            E. Name the closest lattice point to the circumcenter. What is true about the circumcenter of the triangle?            F. Draw a circle to indicate the relationship of the circumcenter to the triangle.</p>

CIRCLE EQUATIONS & GRAPHS

Exam Review #4

1 The general equation of a circle is given as

$$(x - h)^2 + (y - k)^2 = r^2$$

where (h, k) are the coordinates of the center of the circle and r is the radius.

Given the center and the radius graph each circle on the coordinate plane and write the equation of the circle.

A center = (4, -3)

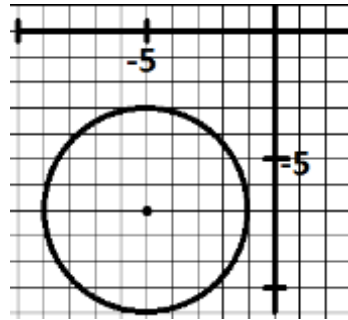
radius = 2

B center = (-5, 2)

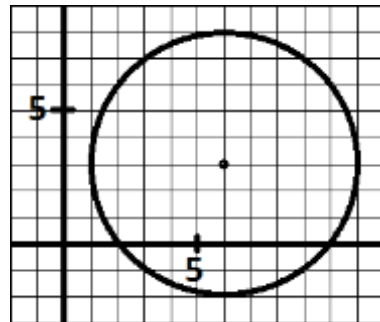
radius = 3

2 Given the circles, identify the center and the radius and write the equations.

A



B



CIRCLE EQUATIONS & CIRCLE AREAS

Exam Review #4

3 Identify the center and the radius. Graph the circle.

A.

$$(x - 3)^2 + (y + 5)^2 = 36$$

B.  $(x + 6)^2 + (y - 1)^2 = 4$

C. The endpoints of the diameter of a circle are at (2,3) & (8,11). Identify the **center** and the **radius** and write the **equation** of the circle.

4 In the diagram, the equation of the small circle is

$$(x - 3)^2 + (y - 3)^2 = 9$$

The quarter circle is part of a circle with the equation:

$$x^2 + y^2 = 100.$$

Find the area of the shaded region.

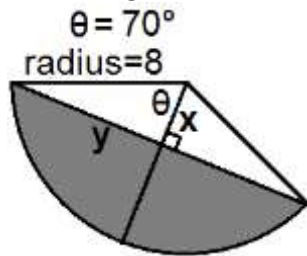
Find the perimeter of the shaded region.



**CIRCLES, AREAS,  
& TRIG**

**Exam Review #4**

- 5 The diagram shows a **sector** with radius 8 and the angle marked  $\theta = 70^\circ$ .
- A Find the area of the **sector** of the circle.
- B Find the value of X & Y.
- C Find the area of the two white **triangles**.
- D Find the area of the **segment** which is the shaded region.



- 6 Use trig ratios to solve.
- A The angle of elevation from the ground to the kite you are flying is  $50^\circ$  and you have let out 300 ft of kite string. How high is the kite in the air? How far horizontally is the kite from where you are standing?
- B What angle does the draw bridge make with the horizontal if the rising bridge span is 100 yards long and the end of the bridge span rises 86 yards in the air?

**CIRCLES &  
CYCLIC QUADS**

**Exam Review #4**

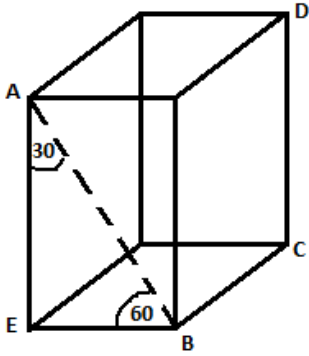
- 7 Graph the four lines on a coordinate grid X[-10,14] Y[-8,16].
- a)  $y = \frac{1}{7}(x-1)+11$       b)  $y = 3(x+7)+7$
- c)  $y = -\frac{1}{2}(x-2)-1$       d)  $x=8$

- The intersection points create a **cyclic quadrilateral** that is inscribed in a circle. Follow these steps:
- 1 Graph & find the vertices of the quadrilateral.
  - 2 Find the midpoints of two sides of the quadrilateral.
  - 3 Draw the perpendicular bisector of these two sides of the quadrilateral. The intersection of these two perpendicular bisectors is the center of the circle.
  - 4 State the (x, y) coordinate for the **center** of the circle.
  - 5 Find the distance from the center to one of the vertices which is the **radius** of the circle.
  - 6 Write the **equation** of the circle.
  - 7 Draw the circle that passes through the four vertices of the quadrilateral.

**SURFACE AREAS  
OF 3-D SOLIDS**

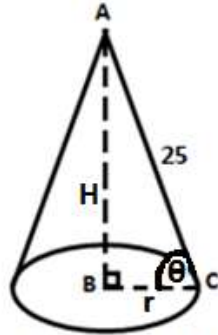
**Exam Review #5**

1 Rectangular prism:  
Diagonal AB=20 in &  
BC=13 in  
Find the total surface area  
of the prism.



Find the length of the long  
diagonal AC or DE.

2 Cone with units labeled in  
centimeters & theta in  
degrees.  
Find the total volume of the  
cone by finding the area of  
the base then multiplying by  
the height and dividing by 3.

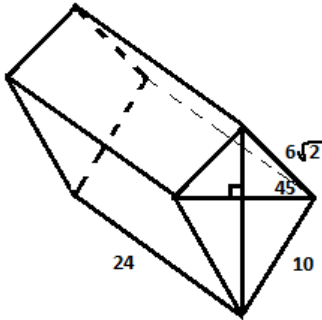


**$\theta = 73.73979529^\circ$**

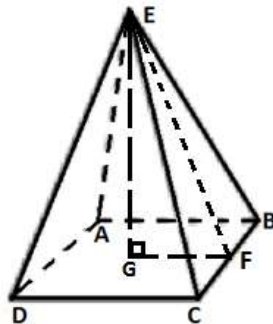
**VOLUMES  
OF 3-D SOLIDS**

**Exam Review #5**

3 Right Kite Prism:  
Height = 24 cm. Base edges:  
10 cm and  $6\sqrt{2}$  cm.  
Find the volume of the  
prism.



4 Square pyramid with slant  
height: EF = 13 cm.  
Apothem: GF = 5 cm  
Find the volume of the  
pyramid by finding the area of  
the base then multiply by the  
height and divide by 3.)



5 3-D Cylindrical  
annulus with sector  
removed: R=8 cm, r=5  
cm, H=12 cm,  
angle=70°.  
Find the volume.

