

<p>1. The image of the origin under a certain translation is the point <math>(2, -6)</math>. The image of point <math>(-3, -2)</math> under the same translation is the point</p> <p>(1) <math>(-1, -8)</math>                      (3) <math>(-\frac{3}{2}, \frac{1}{3})</math>  (2) <math>(-6, 12)</math>                        (4) <math>(-5, 4)</math></p>	<p>4. Which of the following transformations could map the point <math>(1, 2)</math> onto the point <math>(3, 6)</math>?</p> <p>(1) <math>T_{2,3}</math>                                (3) <math>D_3</math>  (2) <math>T_{3,2}</math>                                (4) <math>r_{y=x}</math></p>
<p>2. In which quadrant would the image of point <math>(4, 5)</math> fall after a dilation using a factor of <math>-3</math>?</p> <p>(1) I                                        (3) III  (2) II                                        (4) IV</p>	<p>5. Solve algebraically: <math>\sqrt{x+5} + 1 = x</math></p>
<p>3. Which symbol has both point and line symmetry?</p> <p>(1) ♣                                        (3) ♥  (2) ♦                                        (4) ♠</p>	<p>6. For what positive value of <math>k</math> is the graph of <math>y = x^2 - 2kx + 16</math> tangent to the <math>x</math>-axis?</p>
<p>7. A vulture swoops down on its prey and then rapidly ascends into the air. Its height above the ground, in feet, after <math>t</math> seconds is given by the equation <math>v(t) = 10 t - 20 </math>. At the same time, an egg falls out of a bird's nest, located 210 feet above the ground. Its path is described by the equation <math>e(t) = -0.1t^2 - t + 210</math>.</p> <p>(a) Graph and label both equations.  (b) After how many seconds do the egg and the vulture collide? (Round to the nearest hundredth of a second.)  (c) Determine the height at which the egg and the vulture collide. (Round to the nearest hundredth of a foot.)</p>	

8. The centripetal force on an object moving in a circular path varies inversely as the radius of the circle. If a 55-pound force acts on an object traveling in a circular path with a radius of 10 feet, then what is the *diameter* of the circular path where the centripetal force acting on the object is 75 pounds?

9. What is the length of the major axis of the ellipse  $36(x - 9)^2 + 9(y + 18)^2 = 324$  ?

10. Solve for  $x$  and express in simplest  $a + bi$  form:  $\frac{x + 8}{5} + \frac{x + 5}{x} = 1$ .

11. Triangle  $AMY$  has coordinates  $A(2, 5)$ ,  $M(7, 3)$ , and  $Y(4, 6)$ .

- a) On the accompanying grid, draw and label triangle  $AMY$ .
- b) Graph and state the coordinates of triangle  $A'M'Y'$ , the image triangle  $AMY$  after a reflection in the line  $y = -x$ .
- c) Graph and state the coordinates of triangle  $A''M''Y''$ , the image of triangle  $AMY$  after a reflection in the origin.
- d) Graph and state the coordinates of triangle  $A'''M'''Y'''$ , the image of triangle  $AMY$  after the translation  $T_{-3, -4}$ .
- e) Graph and state the coordinates of triangle  $BNZ$ , the image of triangle  $A'''M'''Y'''$  after the dilation  $D_2$ .

