

Name: \_\_\_\_\_

**M\$5 Mid-year Exam Review**

<p>1. State the domain and range of each function:                      a) <math>y = \sqrt{10 - x}</math>                      b) <math>y = \frac{1}{\sqrt{10 - x}}</math></p>	<p>2. It takes Max 1 hour longer to type a term paper than it takes Kim. If Kim types alone for 2 hours, and then Max types alone for 3 more hours to finish the term paper, how long would it have taken each to type the term paper alone?</p>
<p>3. Given the equation <math>0 = ax^2 + bx + c</math>, in which <math>a</math>, <math>b</math>, and <math>c</math> are integers. If the discriminant of this equation is equal to 8, then the roots of the equation must be                      (1) real                      (3) equal                      (2) positive                (4) rational</p>	<p>4. What is the image of <math>(-5, 2)</math> under the transformation <math>r_{y=x} \circ R_{-90^\circ}</math>?</p>
<p>5. Find the multiplicative inverse of <math>4 - 3i</math> in simplest <math>a + bi</math> form.</p>	<p>6. a) A quadratic equation has roots <math>-4</math> and <math>9</math>. Write the equation and state the discriminant.                      b) Sketch a parabola which has two real, rational, and equal roots.</p>
<p>7. Solve and express the roots in simplest <math>a + bi</math> form: <math>\frac{3}{x-3} - 5 = -x</math></p>	<p>8. Which of the following is an equation of an ellipse?                      (1) <math>\frac{(x+2)^2}{9} = 1 + \frac{y^2}{9}</math>                      (2) <math>(x-4)^2 + 3(y+4)^2 = 27</math>                      (3) <math>(x+5)^2 - (y-10)^2 = 30</math>                      (4) <math>\frac{x+4}{16} + \frac{y-2}{64} = 1</math></p>
<p>9. A function, <math>f(x)</math>, is graphed on a coordinate plane. After a rotation, the image of <math>f(x)</math>                      (1) must also be a function                      (2) cannot be a function                      (3) could be a function, but doesn't have to be one                      (4) There is not enough information to make a conclusion.</p>	<p>10. a) For what value of <math>x</math> is the expression <math>(x+1)^{-2}</math> undefined?                      b) If <math>h(x) = 16x^{-\frac{2}{5}}</math>, find <math>h(32)</math>.</p>
<p>11. a) Solve: <math>3y^{\frac{3}{2}} = 192</math>                      b) Solve: <math>2^{3y-6} = 8</math>                      c) Solve: <math>\left(\frac{1}{9}\right)^x = 27^{1-x}</math></p>	<p>12. If <math>z_1 = 3 - 2i</math> and <math>z_2 = 5 + 3i</math>, show the sum of <math>z_1 + z_2</math> graphically.</p>
<p>13. Simplify: <math>\left(\frac{x+y}{y}\right)\left(\frac{xy}{x^2+2xy+y^2}\right)</math></p>	<p>14. Which set is closed under division?                      (1) integers                      (3) whole numbers                      (2) rational numbers        (4) none of the above</p>