

Please put your name on this sheet and on each piece of lined paper that you use. Show your work and write your answers on the lined paper, not on this sheet. Be sure to follow directions carefully and show all your work. There is a total of 40 points on the exam.

(5) 1. Rachel and Maggie each receive an inheritance from their grandfather. As the older sister, Rachel receives \$2000 more than Maggie. Rachel invests her share at an annual interest rate of 10%, and Maggie invests her share at 8%. If the total amount of interest earned by the sisters in the first year is \$1325, how much money did each inherit? Write your answer in sentence form with correct units.

2. Solve for x . Write your answer in interval notation. $-8 < -3x + 7 \leq 7$

3. Solve for x . Write your answer in interval notation. $\frac{x+6}{x-2} \geq 5$

4. Find the x -intercept of the line $5x - 3y = 9$

(2) 5. Determine whether or not the graph of the equation below is symmetric with respect to the y -axis. Be sure to show the test.

$$2x + 3y^2 = 4$$

6. Find the midpoint of the line segment joining the points $(-8, -2)$ and $(-4, 3)$.

(3) 7. The following is the equation of a circle. Complete the square to put this equation into standard form.

$$x^2 + y^2 + 12x - 10y + 57 = 0$$

(5) 8. Determine whether or not the graphs of the two circles below intersect. Be sure to show your work and explain your reasoning. An answer without justification will receive minimal credit.

$$(x - 3)^2 + (y - 4)^2 = 9$$

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

(5) 9. Find an equation of the line which passes through the point $(6, 5)$ and is perpendicular to the line through the points $(2, -2)$ and $(-5, -3)$. Write your answer in slope-intercept form ($y = mx + b$).

(2) 10. The following equation has exactly one solution. Use your graphing calculator to find it. Round your answer to two decimal places.

$$\sqrt[3]{x} = x^3 + 5$$

Let $f(x) = 3x - 5$.

(a) Find $f(a)$.

(b) Find $f(a + h)$.

(c) Find $\frac{f(a+h)-f(a)}{h}$

Find the domain of the function $f(x) = \frac{1}{\sqrt{x+1}}$