

**Math 129 - Test 2B**

March 12, 2020

Name \_\_\_\_\_

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations where necessary. Label your axes when graphing.

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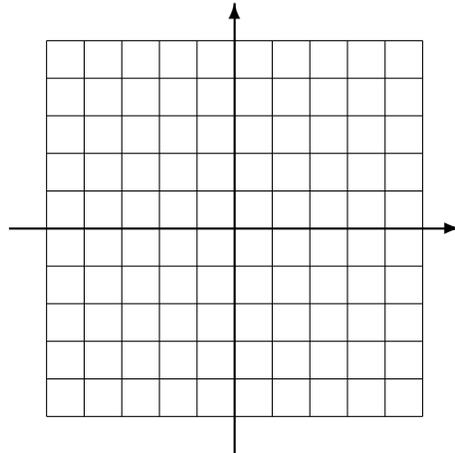
1. (2 points [7,11]) The equation  $(x^3 + 1)^2 - 11(x^3 + 1) + 10 = 0$  is “quadratic in form.” What  $u$ -substitution will reduce the equation to quadratic? Do not solve the equation.

2. (5 points [11]) Solve for  $t$ :  $(3t + 5)^{3/2} - 3 = 24$

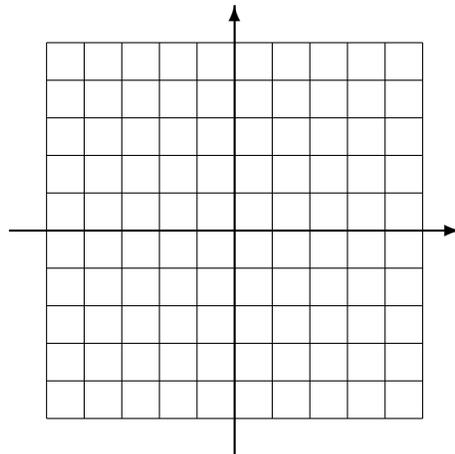
3. (5 points [11]) Solve for  $x$ :  $\sqrt[3]{2x + 3} + 7 = 10$

4. (3 points [11]) Solve for  $v$ :  $(2v - 3)^{1/4} = -1$

5. (6 points [2,4]) Find two solutions of the equation  $-4d - 3c = 12$ . Plot your solutions as ordered pairs, and then sketch the graph of the equation. Label your axes.



6. (4 points [9,10]) Sketch the graph of the equation  $(x - 3)^2 + (y + 1)^2 = 4$ .



7. (5 points [2,3,4]) The line  $L$  passes through the points  $(7, 3)$  and  $(-5, 3)$ . Find an equation of the line perpendicular to  $L$  and passing through  $(8, 9)$ .

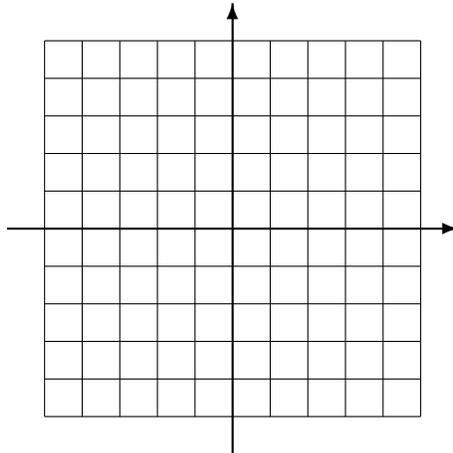
8. (9 points [9,10]) The points  $(2, 1)$  and  $(-6, 4)$  are the endpoints of a diameter of a circle.

(a) Find the center of the circle.

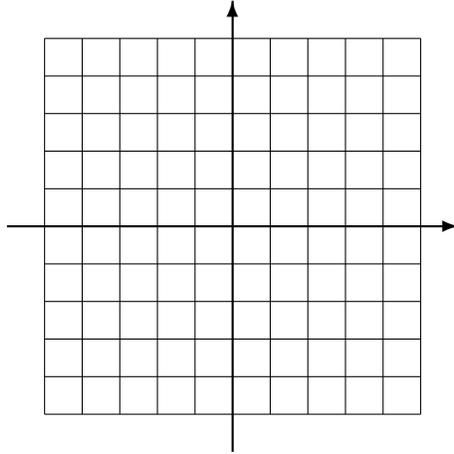
(b) Compute the length of the diameter.

(c) Write the standard form equation for the circle.

9. (6 points [1,9,10]) Make a table that shows five points on the graph of the equation  $y = x^2 + 1$ . Then plot your points and sketch the graph. (Label your axes.)



10. (6 points [2,4]) A line with slope  $\frac{3}{5}$  passes through the point  $(4, 3)$ . Use the point and slope to graph the line. Briefly explain how you did so. (Label your axes.)



11. (8 points [2,3,4]) Bartlep's Heating and Cooling charges a flat fee of \$120 to make a house call, but then charges a constant hourly rate on top of that. A technician recently made a house call to fix a furnace and ended up billing the client \$230 after 2 hours of work.

(a) Sketch the graph that shows client cost (in dollars) versus time (in hours). Label your axes. (Your vertical axis should be the cost axis.)

(b) Which single word or phrase in the problem situation indicates that the graph should be a line?

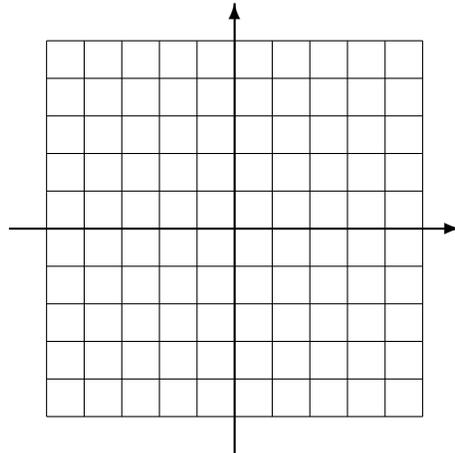
(c) Compute the slope of the graph. What does the slope of the graph represent?

12. (4 points [2,3,4]) Determine equations of the horizontal and vertical lines that pass through  $(7, -2)$ . Label which is which.

13. (6 points [2,4]) Find an equation of the line that passes through the points  $(1, 8)$  and  $(-4, -2)$ . Write your final answer in slope-intercept form.

14. (3 points [9,10]) The graph of the equation  $x^2 + y^2 = 1$  is a circle. Determine the center and radius of the circle.

15. (6 points [3]) Find the  $x$ - and  $y$ -intercepts of the line described by  $6x + 5y = 12$ . Then sketch the graph of the line. Label the axes and the intercepts.



16. (8 points [11]) Solve for  $w$ :  $\sqrt{3w+9} + 7 = w + 10$

17. (6 points [2,3,4]) An event planner is determining the cost to host a party at a certain venue. For 100 people, the cost is \$1755.00, and for 150 people, the cost is \$2242.50. Assume that the number of people and the cost satisfy a linear equation. Find that linear equation. Write your final answer in slope-intercept form.

18. (8 points [2,4]) Find an equation of the line that passes through the point  $(-2, 7)$  and is parallel to the line described by  $6x - 3y = 8$ . Write your final answer in standard form.