

NAME: _____ Score _____/10

Please **print** your name**SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION**

1. **T F** In a Cartesian coordinate system, the point of intersection of the two number lines is called the beginning point. **It is called the origin.**
2. **T F** The graph of an inequality in two variables is a region of the Cartesian coordinate system.
3. What is the length of the line segment joining (1, 3) and (-1, 7)?
Show your work. State the formula you intend to use and then use it. No decimal approximations! Lengths may be irrational numbers!

Use the distance formula $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ to obtain

$$d = \sqrt{(1 - (-1))^2 + (3 - 7)^2} = \sqrt{(2)^2 + (4)^2} = \sqrt{20} = 2\sqrt{5}$$

Many used the formula for the slope of the line through two points. You must know the few formulas. There is a significant difference between x_2 and x^2 . You cannot use them interchangeably. You cannot hope to succeed in any math classes if your approach is so casual and careless to not see the difference between x_2 and x^2 .

4. To find the x-intercepts of a graph we let $y = 0$ and solve for x .
5. Write the equation of a circle with radius 5 and center at the point (2, -3).
State the formula you intend to use and then use it.

Because the center of this circle is not the origin we use the general equation for a circle with center (h,k) and radius r. Use $(x - h)^2 + (y - k)^2 = r^2$ with $h = 2$, $k = -3$ and $r = 5$ to obtain

$$(x - 2)^2 + (y - (-3))^2 = 5^2 \text{ which simplifies to } (x - 2)^2 + (y + 3)^2 = 25$$

You must know the few formulas.

6. If (2, j) is on the graph of $y = x^3 - x^2 + 2x + 3$, what is the value of j?
Show your work and explain (with words) your work.
Because (2, j) is on the graph, the ordered pair is a solution to the equation. That means a true statement results if the variables are replaced with the coordinates. So we replace y with j and replace x with 2 to obtain the true statement $j = 2^3 - 2^2 + 2(2) + 3 = 11$.
Many of you replaced x with 0 and then concluded that $j = 3$. You make that kind of error if you neglect what it means to say (2, j) is on the graph of the equation. The solution presented above has been discussed extensively in class and is not difficult to understand. But you do have to read about and study the concept of graph.
When you replace x with 0 to obtain 3 for y, you have found the y-intercept which had nothing to do with the question.

7. If $(m, 32)$ is on the graph of $y = x^5$, what is the value of m ?

Show your work and explain (with words) your work.

Because $(m, 32)$ is on the graph, the ordered pair is a solution to the equation. That means a true statement results if the variables are replaced with the coordinates. So we replace y with 32 and replace x with m to obtain the true statement $32 = m^5$. From this it is easy to see, $m = 2$.

The language I saw here indicates we have a lot of work to do in Chapter 5!

8. What is the relation between the equations $y = 3x^2 - 2$ and $y + 6 = 3x^2 + 4$? Your response should be a complete English sentence.

Because the second equation was obtained by adding 6 to both sides of the first equation, the two equations are equivalent.

In this case you cannot conclude the two equations are equivalent because they have the same solution set. You don't know their solution sets. This was a common error.

You can conclude that they are equivalent because the second equation is clearly obtained from the first by adding 6 to both sides (**Property 1 of equations**). If you insist on not learning the fundamental properties of equations and inequalities, you cannot hope to succeed in any math class.

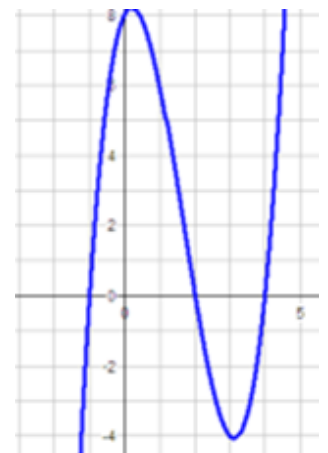
There seemed to be considerable faulty logic employed with this question. Therefore I would like to point out the following.

Notice that in this case you cannot conclude they are equivalent because they have the same solution sets, but you can conclude that they have the same solution sets because they are equivalent.

9. Refer to the graph of an equation in two variables at the right. Is the ordered pair $(3, 4)$ a solution for the equation? This computer generated graph is pretty accurate. Explain (with words) why or why not.

Clearly the point $(3, 4)$ is not on the graph of the equation. Consequently the ordered pair $(3, 4)$ is not a solution of the equation.

The graph is the blue curve. It is not the entire picture. Recall the definition of graph—it includes those points and only those points whose coordinates are solutions of the equation. The Cartesian coordinate system is not part of the graph. For convenience and uniformity we simply choose to sketch the graph on the Cartesian coordinate system.



The blue curve is not a line!!!

You cannot hope to succeed in any math classes if your approach is so casual and careless to not distinguish, by name, one mathematical creature from another.

10. What is the relation between the graph of $y = 3x^2 + 2$ and the graphs of $y < 3x^2 + 2$ and $y > 3x^2 + 2$? Your response should be a complete English sentence.
The graph of the equation forms a boundary between the graphs of the two inequalities.

We have gone over this dozens of times. It is a simple concept. If you fail to grasp it, I believe you are not studying or your study methods are misguided. How many times does the above red statement appear in your lecture notes? How many times does it appear in your study notes?