Math 1513 - College Algebra

Exam 2 - 2020.10.09

Name: _____

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1. Determine if either of the following relations is a function.

   (a) $\{(\odot, \star), (\otimes, \times), (\bullet, \oplus), (\bigtriangledown, \odot), (\lhd, \rhd), (\otimes, \star)\}$

   (b) $\{(1, \otimes), (2, \ominus), (3, \odot), (4, \odot), (5, \oplus), (6, \otimes), (7, \oslash), (8, \odot)\}$

2. For the relation in 1 (a), state the domain and range.

3. Create two related sets, A, and B which do not involve numbers, and construct a function between them. Each of the sets A and B must have at least 6 elements in them. Explain how your function assigns element of the domain A to elements of the range B.

4. The following is the graph of a function $f(x)$. Use this graph to answer the questions below.

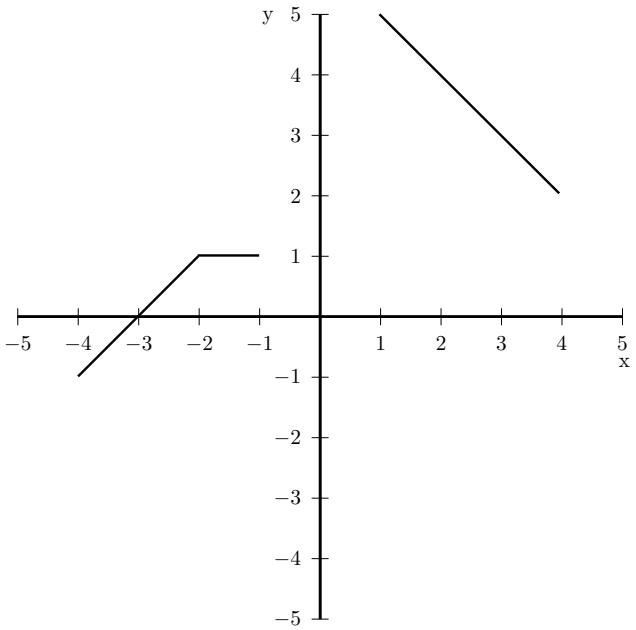


Figure 1: Graph of a function $f(x)$ for problem 4.

(a) What is the domain of $f(x)$?

(b) What is the range of $f(x)$?

(c) When is $f(x)$ positive?

(d) When is $f(x)$ decreasing?

5. Consider the two points $(-1, 2)$ and $(3, 4)$ to answer the following questions:

   (a) Compute the distance between the two points.

   (b) Find the midpoint of the line segment connecting the two points.

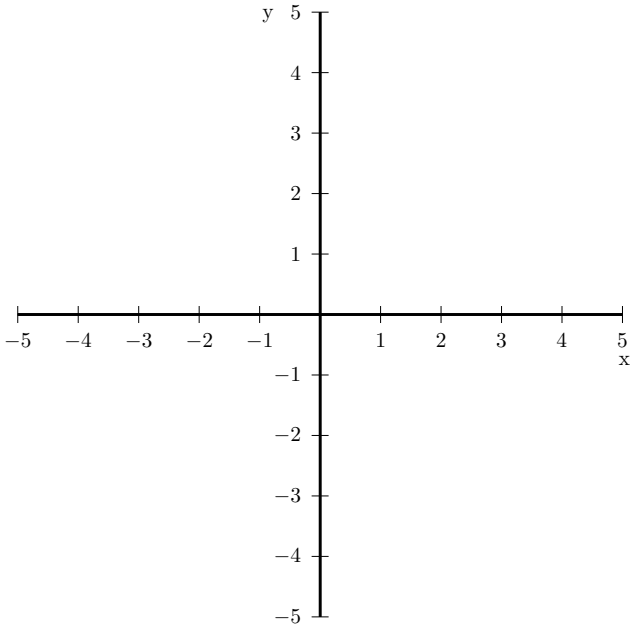
6. Rewrite the following equation: $x^2 + 3x + y^2 - 5y = 1$ in the standard form for the equation of a circle, then state the center and radius of the circle.

7. Compute the slope of the line given by $3x - 2y = 4$.

8. What is the slope of any line perpendicular to $y = -3x + 4$?

9. Compute the x- and y-intercepts of the line $y - 2 = 3(x + 1)$.

10. Sketch the graph of $y = -\frac{2}{3}x - 1$.



11. If $W(t) = 3t + 5$ is a linear function where t is measured in days and W in walruses, what are the units on the slope $m = \frac{\Delta W}{\Delta t} = 3$?

12. Let $f(x) = \sqrt{x^2 + 1}$, and use it to answer the following questions.

(a) State the implied domain of $f(x)$.

(b) Evaluate $f(-1)$.

(c) What is $f(a)$?

(d) What is $f(4 + a)$?

(e) Is $f(x)$ even, odd, or neither?