

COLLEGE ALGEBRA

EXAM #1

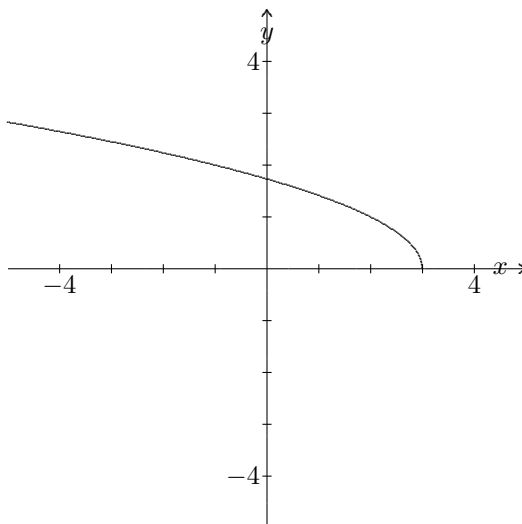
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MULTIPLE CHOICE QUESTIONS

Instructions. For each of the following questions, select the “best” answer and darken the corresponding oval on your scantron sheet.

1. Consider the graph of the following function.



Which of the following best describes the range of the function f ?

- a) $[0, \infty)$ b) $(-\infty, 0]$ c) $(-\infty, 3]$ d) $[3, \infty)$ e) $[-3, 3]$

2. If

$$f(x) = \begin{cases} -3, & \text{if } x < 0; \\ x + 1, & \text{if } 0 \leq x < 4; \\ 5, & \text{if } x \geq 4, \end{cases}$$

the $f(-2)$ equals

- a) 0 b) 4 c) 5 d) -3 e) -1

3. The equation of the line passing through the the origin that is perpendicular to the line $2x + 5y = 10$ has equation

- a) $y = \frac{2}{5}x$ b) $y = \frac{5}{2}x$ c) $y = -\frac{2}{5}x$ d) $y = -\frac{5}{2}x$ e) None of these

Typeset by $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{T}\mathcal{E}\mathcal{X}$

4. What is the distance between the points $(4, -3)$ and $(-2, 4)$?
 a) $5\sqrt{17}$ b) $3\sqrt{21}$ c) $\sqrt{58}$ d) $\sqrt{85}$ e) None of these
5. What is the midpoint of the segment joining the points $(3, 4)$ and $(5, 10)$?
 a) $(-1, -3)$ b) $(1, 3)$ c) $(7, 4)$ d) $(4, 8)$ e) None of these
6. What is the radius of the circle whose equation is $(x + 3)^2 + (y - 4)^2 = 50$?
 a) 50 b) $2\sqrt{5}$ c) $5\sqrt{2}$ d) 25 e) $5\sqrt{10}$
7. The graph of the relation $x^2 = 4y^2$ is symmetric with respect to
 a) y -axis b) origin c) x -axis d) x -axis, y -axis, and the origin

ESSAY QUESTIONS

Instructions. Place the solution of each of the following questions on your own paper. You must follow directions explicitly and show all of your work to receive full credit for your solution. At the end of the examination, gather your solutions, place them in order, then staple this exam to your solutions as a cover sheet.

8. Suppose that $f(x) = x^2 + 3x$. Simplify
- $$\frac{f(x) - f(2)}{x - 2}.$$
9. Consider the function $f(x) = |x + 1| - |x - 5|$.
- Craft a piecewise definition for $f(x)$.
 - Use the piecewise definition found in part (a) to sketch the graph of f on a sheet of graph paper. Be sure to label and scale each axis.
10. Consider the function $y = 1.2x^2 - 2.3x - 15.12$.
- Use your calculator to draw the graph of the function f . Adjust the window parameters so that all important behavior of the graph is visible in the viewing window (turning points, intercepts, etc.). Make a copy of the plot in your viewing window on your examination paper. Label the axes and scale each axis with the parameters used to create your viewing window.
 - Use your calculator to find the zeros of the function f . Label the zeros on your plot in part (a) with their coordinates. Do not round.
 - Use your calculator to find the relative extrema (local maximum and minimum) of the function f . Label these extrema on your plot in part (a) with their coordinates. Do not round.
 - Use interval notation to describe the set of x for which the function f is increasing. Use interval notation to describe the set of x for which the function f is decreasing.