

TEST #1

- ✓ Pick 10 of 11. If you work all 11 problems, your grade will reflect your best 10 answers.
- ✓ You may use approved technology (such as a graphing calculator) on this test.
- ✓ You may use your own paper on this test.
- ✓ You may submit your answers in Canvas or directly to me by email.
- ✓ You **must** show all of your work to receive full credit when appropriate.
- ✓ NO WORK = NO CREDIT!!
- ✓ **Complete the box below. This is mandatory!** If you are unable to print this page, make a duplicate of the box below and submit it along with your paper.

By checking the box and signing below, you are certifying that the following answers to this test are yours and yours alone. You are certifying that you did not collaborate with anyone, nor access any material except the textbook, homework, eLearn content, notes that you produced and approved technology.

☐ I agree. The following answers are mine and mine alone.

Sign Here

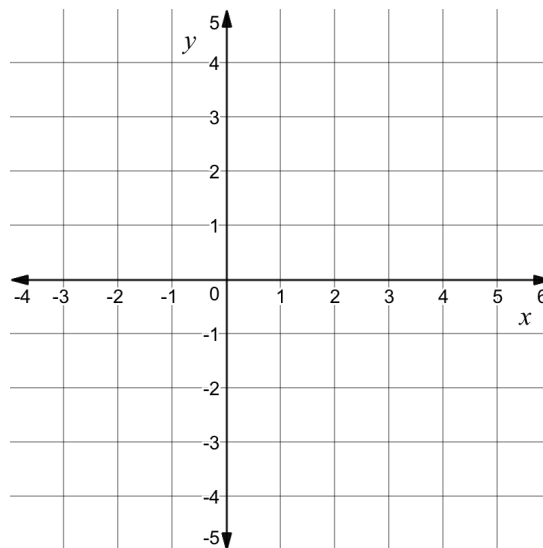
The questions for this test start on the following page.

1. Find the average rate of change of $f(x) = \sqrt{10x + 3}$ on the interval $[2, 5]$. Round to 2 decimal places.

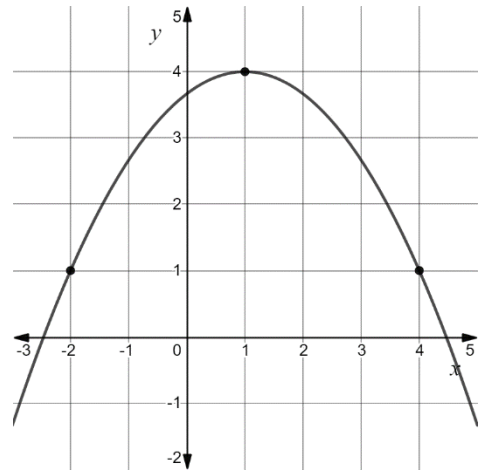
2. Find the difference quotient of $f(x) = 11x^2 + 3$.

3. Complete the following for $g(x) = \begin{cases} x + 1, & \text{if } -1 \leq x < 2 \\ 4 - x, & \text{if } 2 \leq x \leq 5. \end{cases}$

- (a) Determine the domain of g .
- (b) Evaluate $g(2)$.
- (c) Graph g .
- (d) Is g continuous on its domain?



4. Use the graph (on the right) to model: $f(x) = a(x - h)^2 + k$.



5. For $f(x) = 2x^2 - 12x + 23$, (a) sketch the concavity and identify the (b) vertex, (c) axis of symmetry, (d) range, (e) maximum or minimum value, (f) intervals where the function is increasing and where it is decreasing and (g) y-intercept. Then, (h) explain why the graph has no x-intercepts.

6. Simplify and write in standard form $\frac{12 \pm \sqrt{-60}}{10}$.

7. Use your calculator to find a linear or quadratic function that best models the data below.

x	6	10	12	14
$f(x)$	0	25	50	75

- (a) Circle the appropriate type of regression for the data set. Be sure to justify your answer.

Linear

Quadratic

Justification:

- (b) Write down your regression equation. Round to 1 decimal place.

- (c) Use your model to predict $f(x)$ when $x = 5$.

- (d) Did your answer involve interpolation or extrapolation?

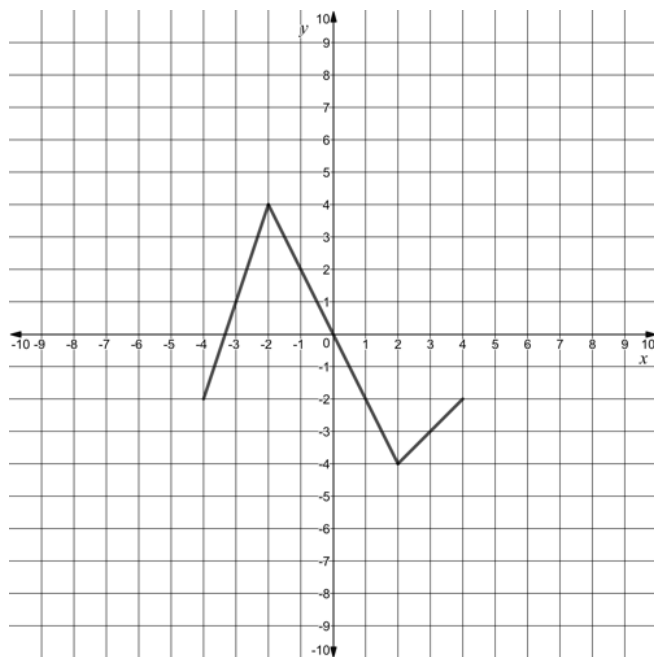
8. Use the quadratic formula to find the x-intercepts of $f(x) = 3x^2 - 9x + 4$. Round to 1 decimal place.

9. Find the domains of (a) $f(x) = \frac{x+1}{x-4}$ and (b) $g(x) = \frac{x+1}{x^2-8x+15}$. Write your solutions in interval notation.

10. Write an equation for a function that has a graph with the shape of $y = |x|$, but is shifted right by 10 units, reflected about the x-axis, and shrunk vertically by a factor of $\frac{1}{4}$.

11. Use the graph of $f(x)$ (on the left) to graph the transformation given (on the right).

$f(x)$



Graph $-2f(x+3)$

