

MAT 171 Sample Final Exam

General Instructions: Answer each question in the book provided. Partial credit will be given, so show all of your work and label each of your graphs with at least 3 coordinates. Calculators are NOT permitted.

Scoring. Problems 1-12 are worth 4 credits each. Problems 13 and 14 are worth 5 credits each. Problems 15 and 16 are worth 6 credits each.

1. Let $f(x) = x + 5$ and let $g(x) = x^2 + 5x$. Specify the domain of $f(x)/g(x)$.
2. Simplify: $\frac{\frac{4}{x-6} - \frac{4}{x+6}}{\frac{8}{x^2-36}}$
3. Draw the graph of $|x - 2| + 4$.
4. Write an equation of the line perpendicular to the line $y = 3x - 7$ at $(5, 8)$.
5. Draw the graph of $y = 3x^2 + 6x - 24$ and label its minimum.
6. Draw the graph of $\sqrt{x + 4}$.
7. Write an equation of the line given the graph in Figure A on the back of this page.
8. Write an equation of the parabola given its graph in Figure B on the back of this page.
9. Let $g(x) = \frac{x-6}{3x+1}$. Write the inverse of g and specify its domain.
10. Simplify by using polynomial long division $\frac{x^3 + 4x^2 - 2x + 8}{x - 2}$.
11. Solve for x : $4e^{3x+7} = 128$
12. Let $f(x) = 3x^2 + 7$. Compute and simplify the difference quotient given by $\frac{f(x+h)-f(x)}{h}$.
13. Draw the graph of $f(x) = \frac{x - 3}{x^2 - 49}$. Indicate asymptotes.
14. Draw the graph of $F(x) = \begin{cases} 10 - 5x, & \text{for } x < 1 \\ 5x - 10, & \text{for } x \geq 1 \end{cases}$
15. Use $f(x) = \log_5(2x - 1)$ to address the following problems.
 - (a) Find the domain of f .
 - (b) Compute $f(1)$.
 - (c) Find the number a so that $f(a) = 2$.
16. If 40 people contribute to a performance space, then each pays \$100. For every \$1 less that people pay, 4 additional people contribute. USE AN EQUATION to determine the maximum amount of money that can be raised.

Figures On Back

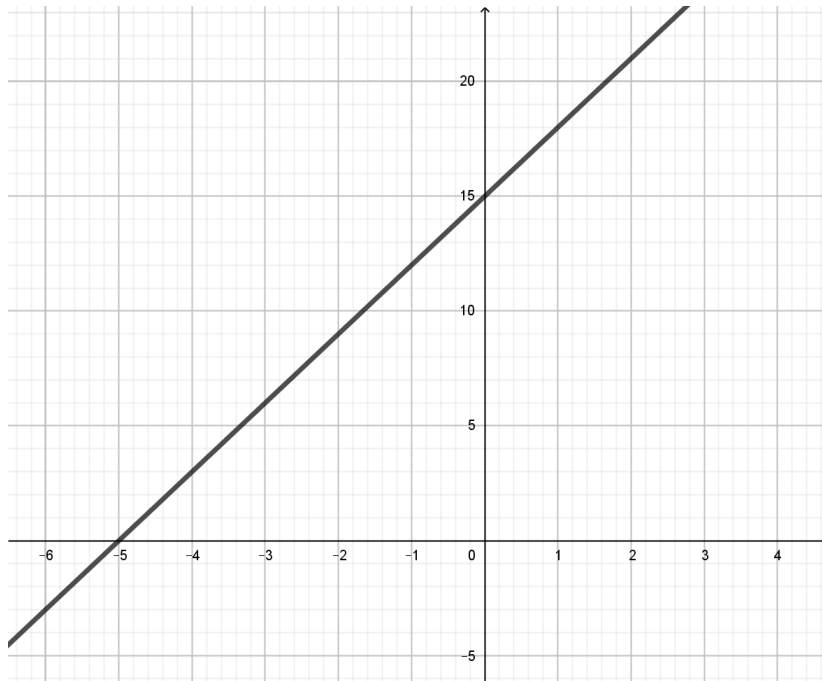


Figure A

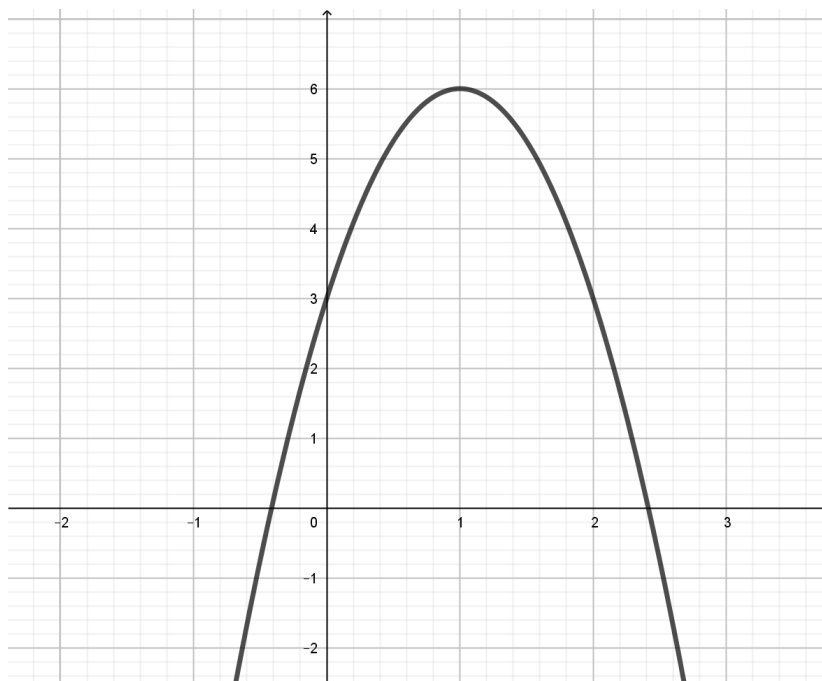


Figure B