

MRS21 – Algebra 2/Trigonometry
Exam 5 Review Sheet

Topics:

- Solving Linear-Quadratic Systems of Equations Algebraically and Graphically
- Solving Higher Degree Polynomial Equations
- Solving and Graphing Compound Inequalities
- Solving Quadratic Inequalities Algebraically
- Solving Quadratic Inequalities in Two Variables
- Graphing Absolute Value Functions
- Solving Absolute Value Equations and Inequalities
- Relations and Functions
- Domain and Range
- Function Notation
- Composition of Functions
- Inverse of a Relation

Be sure to thoroughly prepare for the exam by reviewing (and re-doing) problems in your class notes and homework assignments.

Note that exams are **cumulative**, meaning that some questions on this exam will cover topics that were tested on previous exams and quizzes.

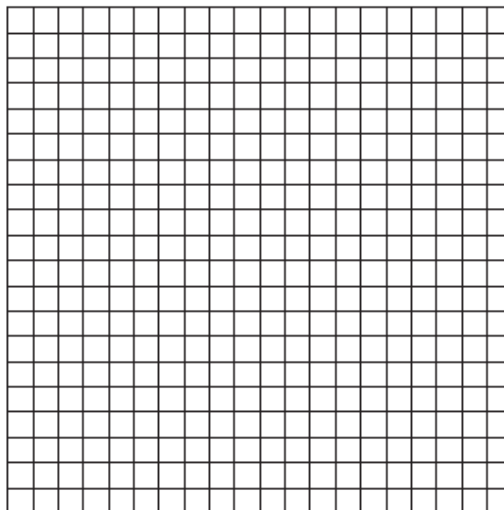
Practice Problems:

1. Solve each system of equations algebraically:

(a) $\begin{cases} 5 = y - x \\ 4x^2 = -17x + y + 4 \end{cases}$ (b) $\begin{cases} x^2 + y^2 = 76 \\ x - y = 6 \end{cases}$

2. Solve the following system of equations graphically. Round values to the nearest tenth.

$$\begin{cases} x^2 + y^2 = 25 \\ y = 2 \end{cases}$$



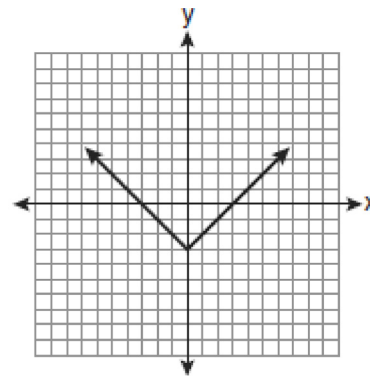
3. Find the solution set: (a) $x^3 - 3x^2 + 8x - 24 = 0$ (b) $x^4 + 2x^3 + 8x^2 = 0$

4. State the solution set: $|6 - 3t| + 4 = 6$

5. State the solution set: $|2x - 1| = x - 5$

6. Which equation is represented by the accompanying graph?

- (1) $y = |x| + 3$
- (2) $y = |x| - 3$
- (3) $y = |x - 3|$
- (4) $y = |x + 3|$



In 7 – 9, solve, graph, and state the solution set using interval notation.

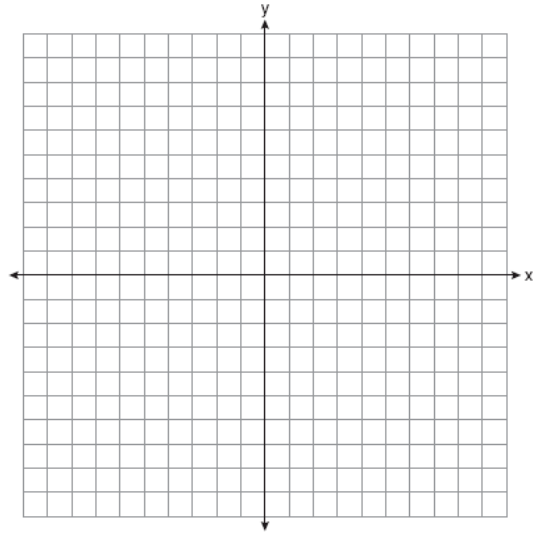
7. $|2x + 3| < 1$

8. $|2y - 1| + 5 \geq 8$

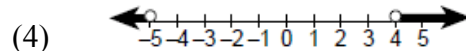
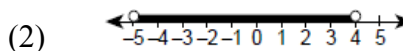
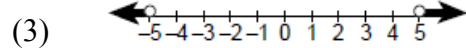
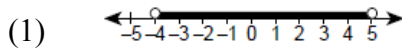
9. $-3 < 3(4 + 5d) \leq 6$

10. Find the solution of the inequality $x^2 - 4x > 5$, algebraically.

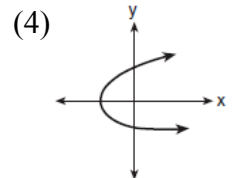
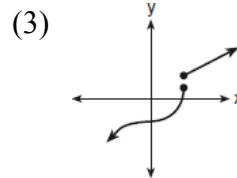
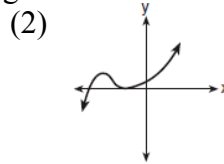
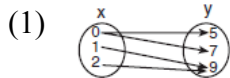
11. Graph the solution of $y > -x^2 - 2x$. Use the graph to determine whether the point $(1, -3)$ is in the solution set of $y > -x^2 - 2x$.



12. Which graph represents the solution set for the inequality $x^2 - x - 20 < 0$?



13. Which diagram represents a relation in which each member of the domain corresponds to only one member of its range?



14. Find the domain for each function:

(a) $f(x) = \sqrt{x-6}$

(b) $g(x) = \frac{2x+5}{\sqrt{7-x}}$

(c) $h(x) = \frac{\sqrt{x+1}}{x^2-9}$

15. The relation defined by the set of ordered pairs $\{(0, 2), (-2, 2), (1, 4), (4, 1), (0, -1)\}$ is *not* a function. Which of the ordered pairs listed below, if omitted from this relation, will make the resulting set a function?

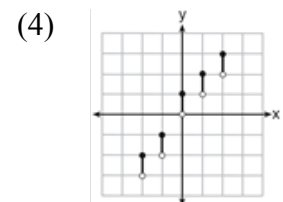
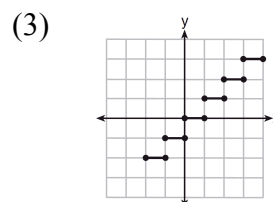
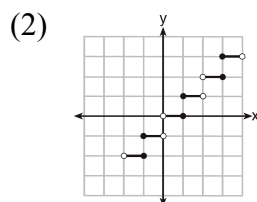
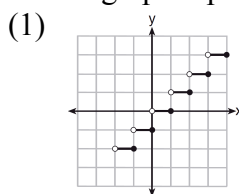
(1) $(-2, 2)$

(2) $(1, 4)$

(3) $(4, 1)$

(4) $(0, -1)$

16. Which graph represents a function?



17. If $f(x) = x^2 + 3x$ and $g(x) = x + 3$, find each of the following:

(a) $(f \circ g)(-2)$

(b) $(g \circ f)(-2)$

(c) $(f \circ g)(x)$

(d) $(g \circ f)(x)$

18. What is the inverse of the function $f(x) = 2x - 5$?

19. If $f(x) = x^2 - 3$, then $f(a - b)$ is equivalent to

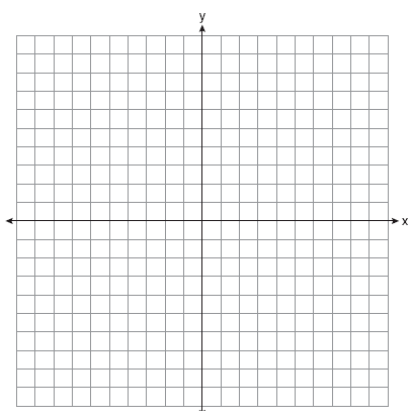
(1) $a^2 - b^2 - 3$

(2) $a^2 - 2ab - b^2 - 3$

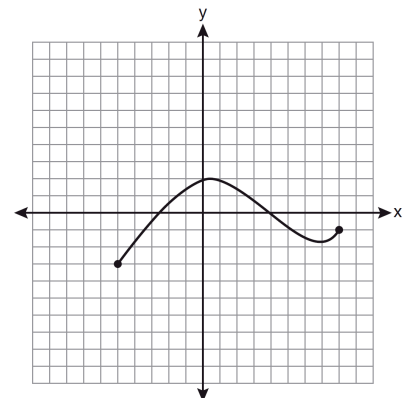
(3) $a^2 - 2ab + b^2 - 3$

(4) $a^2 + b^2 - 3$

20. On the accompanying set of axes, graph the function $f(x) = 2x + 4$ and its inverse, $f^{-1}(x)$.



21. The graph below represents the function $y = f(x)$.



State the domain and range of this function.