

Name _____

Midterm

Algebra with Enrichment

Version 2

Make sure to show all work and simplify all answers.

Chapter 1—Tools of Algebra

For problems 1-2, simplify the expression, showing all steps.

1.
$$\frac{[-2(-5 + 2 \cdot 4)]^3}{-3\left[\frac{33}{-3} - 7(-5)\right]}$$

2.
$$4[3(x - 5) - x(4 - 2y) + 2y(2 - x)]$$

Chapter 2—Solving Equations

For problems 3-4, solve for the variable, showing all steps.

3.
$$2(b - 7) + 15 = 8[3(2 - b) - 7]$$

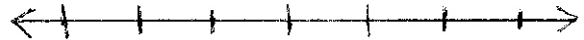
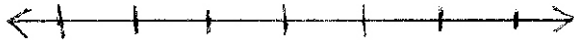
4.
$$\frac{7}{3w + 2} = \frac{3}{2w - 2}$$

Chapter 3—Solving Inequalities

For problems 5-6, solve for the variable, showing all steps. Then graph your answer on a number line.

5. $\frac{5}{6}c < \frac{2}{3}\left(\frac{9}{2} + \frac{3}{4}c\right) + \frac{c}{12}$ OR $\frac{c}{-3} \leq -5$

6. $-72 \leq -2(x+7) - 2 \leq -16$



Chapter 4—Solving and Applying Proportions

7. 3.7% of what number is 31.45?

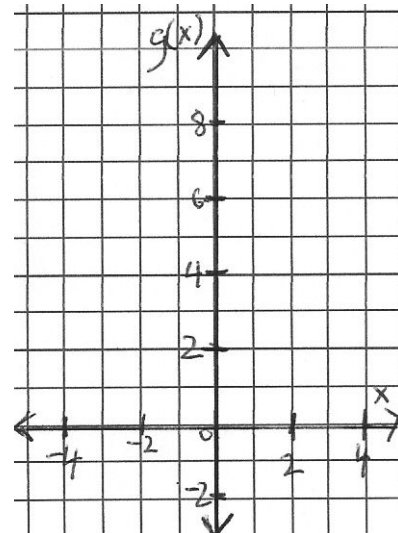
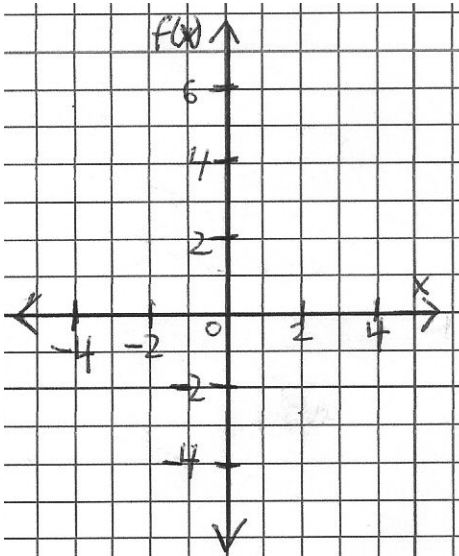
8. For three consecutive rolls of a single die, calculate P(5 then 4 then (not 4)).

Chapter 5—Graphs and Functions

For problems 9-10, graph the function in the space provided. Use the domain $-3 \leq x \leq 3$

9. $f(x) = |x + 2| - 2$

10. $g(x) = \frac{1}{2}x^2 - x$

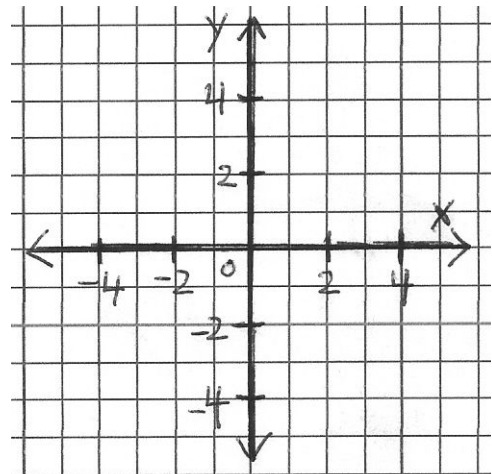
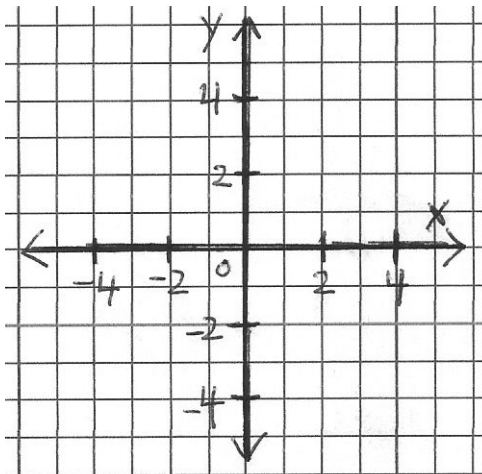


Chapter 6—Linear Equations and their Graphs

For problems 11-12, graph the function in the space provided.

11. $y - 2 = \frac{1}{3}(x + 2)$

12. $3x + 2y = -6$



13. Write the equation *in standard form* of a line that travels through $(3, 5)$ and is parallel to the line

$$2x - 5y = 27$$

14. Write the equation in *point-slope form* of a line that travels through $(3, 5)$ and is perpendicular to the line

$$2x - 5y = 27$$

Chapter 7—Systems of Equations and Inequalities

For problems 15-16, solve the system of linear equations. Check your answer.

15. $4x + 5y = 15$
 $6x - 4y = 11$

16. $x = 3y + 1$
 $y = 3x + 1$

BONUS: Solve this system of non-linear equations and check your answer(s).

$$y = x^2 - 2$$

$$y = 6 - x^2$$