Semester One Review Packet ~ Due: _____
→ Work Must be Shown When Applicable ←

Keep and correct this packet, as it will come in handy when studying for standardized tests: ACT/SAT and college placement exams.

Pace yourself – Do not wait until the night before it is due.

On the exam, you may use a "*CHEAT SHEET.*"

- Computer / Lined Paper ($8\frac{1}{2}$ inches by 11 inches)
- Front and Back Permitted
- Formulas / Examples / Reminders / Words of Encouragement...
- Handwritten or Printed (for smaller font)
- Nontransferable During Exam
- Advisable to Make Additions While Completing the Packet
- Advisable to Make Items Easy To Find
- Keep for Future Classes/Exams...

    *You will most likely find that the cheat sheet will only serve as a "crutch." If you do not know how to use the formulas, it will not help.

On exam day, bring:

- ✓ Calculator You're Familiar With
- ✓ Cheat Sheet
- ✓ Pencil
- ✓ Scrap Paper
- ✓ Something to Keep You Busy

    *Headphones / Phones are only permitted when your exam is submitted and must not be heard by anyone but yourself.

IMPORTANT: NO ASSIGNMENTS WILL BE ACCEPTED AFTER SCHEDULED FINAL EXAMS.

Good luck on the exam and in the future. I hope you learned a lot this semester! ☺

Advanced Algebra II

Name_____

Semester 1 Review

Hour_____

Evaluate each function.

1) $w(x) = -3x + 3$; Find $w(-7)$

2) $h(n) = -n^2 - 3n$; Find $h(n-2)$

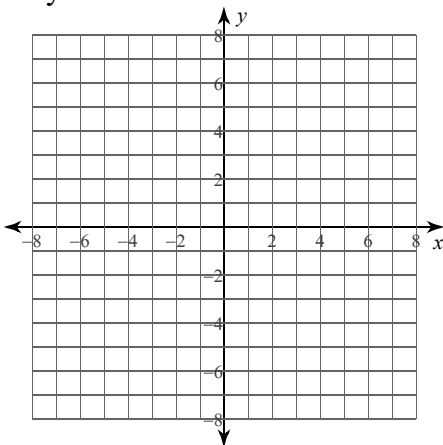**Perform the indicated operation.**

3) $h(a) = 3a - 2$
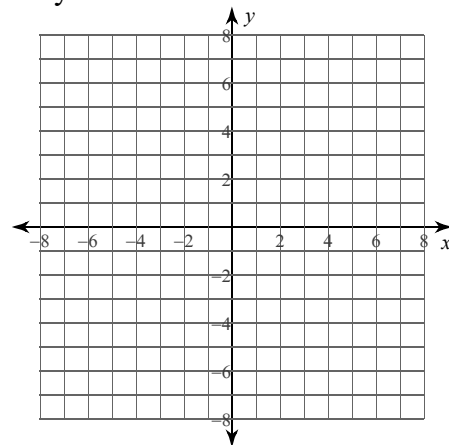$g(a) = a^3 - a^2$
Find $h(a) + g(a)$

4) $f(x) = 2x - 5$
$g(x) = x^2 - x$
Find $f(x) - g(x)$

Sketch the following. (Hint: Recall the vertical line test.)

5) Any Function

6) Any Relation NOT a Function

Complete.

7) A recipe for 6 cupcakes needs 1 cup of flour. The number of cupcakes you can make varies directly with the amount of flour. How many cupcakes can you make with 4 cups of flour?

8) Your wage varies directly with the hours you work. If you make $16 in two hours, how long do you work to make $80?

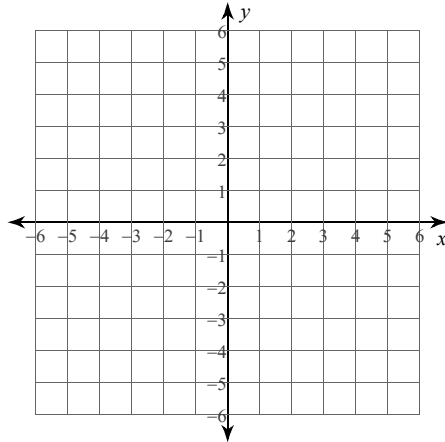**Write the slope-intercept form of the equation of the line through the given points.**

9) through: $(-3, -1)$ and $(-2, 2)$

10) through: $(-2, 3)$ and $(0, -1)$

11) through: $(-5, 4)$ and $(1, 4)$

12) through: $(3, 4)$ and $(3, 1)$

Sketch the graph of each line.
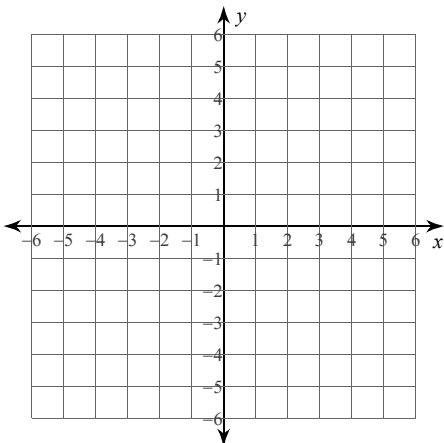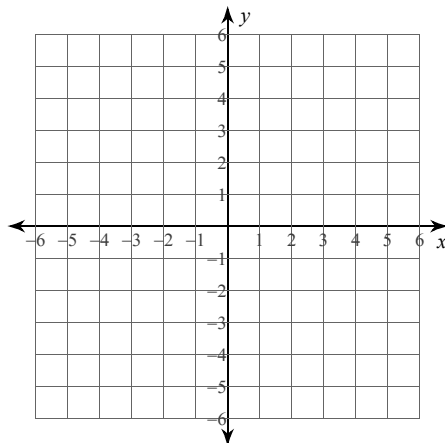
13) $y = x + 1$
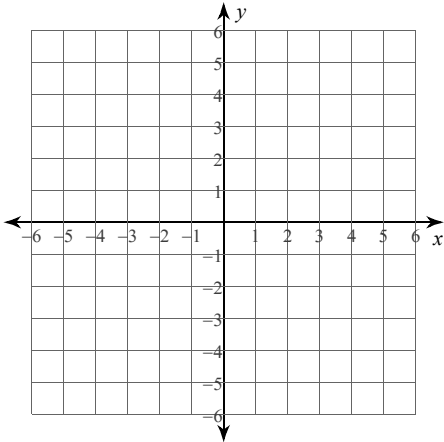
14) $x + 3y = -3$

Complete.

15) A cab company charges a $5 boarding rate in addition to its meter which is $3 for every mile. What is the equation of the line that represents this cab company's rate? Let $x =$ milage.

Graph each equation by plotting the vertex, another point, and using symmetry.

16) $y = 3|x - 2| - 4$

17) $y = -2|x + 2| + 1$

-3-

18) Mofor's school is selling tickets to a play. On the first day of ticket sales the school sold 4 senior citizen tickets and 3 student tickets for a total of $73. The school took in $32 on the second day by selling 1 senior citizen ticket and 2 student tickets. What is the price each of one senior citizen ticket and one student ticket?

19) The senior classes at High School A and High School B planned separate trips to Yellowstone National Park. The senior class at High School A rented and filled 5 vans and 4 buses with 249 students. High School B rented and filled 5 vans and 7 buses with 387 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?
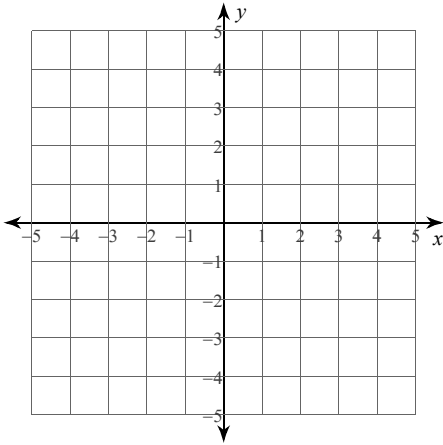
Does the system have one solution, infinitely many solutions, or no solution? (Hint: Putting both equations in slope-intercept form ($y = mx + b$), compare the slopes.)

20) $1 - \dfrac{5}{9}x = -\dfrac{1}{3}y$

$9 - 5x = -3y$

21) $-1 + \dfrac{1}{2}y = \dfrac{3}{4}x$

$-6y + 9x = -6$

Sketch the solution to each system of inequalities.

22) $x + 2y > -4$
$2x + y \geq 1$

23) $x - 2y < -2$
$3x - 2y < 2$
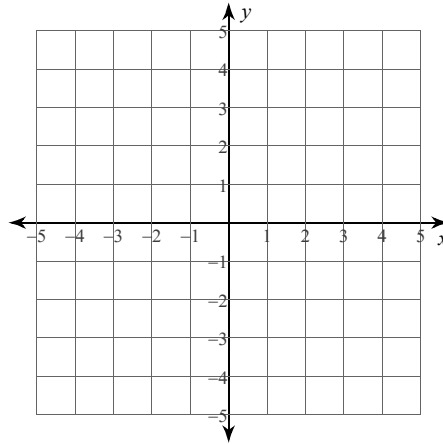
Complete.

24) Arrange the following class data into a matrix and report the dimensions. Let columns be eye color and gender be rows.

For male students' eye color, there are nine brown, three blue, and two green. For female students' eye color, there are two brown, eleven blue, and four green.
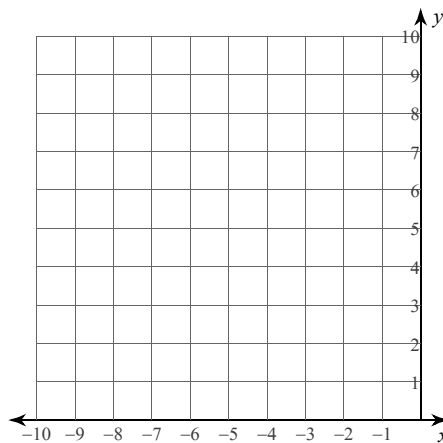
A) $\begin{bmatrix} 9 & 2 \\ 3 & 11 \\ 2 & 4 \end{bmatrix}$; 3 x 2

B) $\begin{bmatrix} 9 & 3 & 2 \\ 2 & 11 & 4 \end{bmatrix}$; 2 x 3

C) $\begin{bmatrix} 9 & 3 & 2 \\ 2 & 11 & 4 \end{bmatrix}$; 3 x 2

D) $\begin{bmatrix} 9 & 2 \\ 3 & 11 \\ 2 & 4 \end{bmatrix}$; 2 x 3

Sketch the graph of each function.

25) $y = -2(x - 3)^2 - 4$

26) $y = 2(x + 2)^2 + 1$

-5-
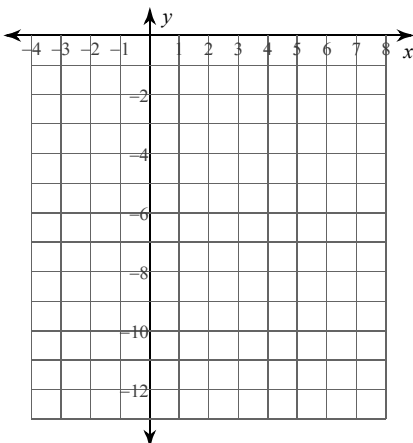
Use the information provided to write the vertex form equation of each parabola. (Hint: Use completing the square.)

27) $y = -2x^2 - 8x - 4$

28) $y = 2x^2 - 40x + 210$

Complete.

29) The height (h) in feet of an object above the ground is given by $h = -16t^2 + 64t + 190$, where t is the time in seconds. Find the maximum height of the object. (Hint: Put the equation in vertex form.)

Factor each completely.

30) $3x^2 - 192$

31) $18n^2 - 132n + 240$

Solve each equation by factoring.

32) $4b^2 = 36$

33) $3x^2 + 24 = -18x$

34) $10v^2 + 12 = -34v$

35) $9x^2 + 39x = -12$

Solve each equation by completing the square.

36) $2a^2 - 16a = 40$

37) $6x^2 + 5 = -12x$

Solve each equation with the quadratic formula.

38) $2x^2 = -5x + 18$

39) $3a^2 - 1 = -4a$

Simplify.

40) $(-2 + 5i) + (8 + 4i)$

41) $(7 + i) - (-6 - 3i)$

42) $(-3 + i)(1 + 5i)$

43) $(-8 - i)^2$

Find the absolute value of each complex number.

44) $\left|-3i\right|$

45) $\left|3+3i\right|$

Find the discriminant of each quadratic equation then state the number and type of solutions.

46) $4p^2 + 4 = 0$

47) $-3r^2 + 4 = -r$

48) $4n^2 = 4n - 1$

Solve each equation with the quadratic formula.

49) $2a^2 - 3a = -5$

50) $4x^2 - 5x = -2$