

MA233H Honors Algebra II Summer Review

Purpose: Review and enhance student understanding of Algebra I concepts that are pre-requisites for Honors Algebra II.

Instructions & Grading: Complete all questions in this packet. Show all work for each question to demonstrate your understanding of the concepts and to earn full credit for this assignment. The questions are graded based on completeness not accuracy. The packet counts as 2 homework assignments.

This packet is due on the first day of class in September. An answer key will be available on the first day of class.

There will be a TEST on this material the second week of school.

Students will need a **TI-84 Plus CE graphing calculator** for this course. In class, all demonstrations of calculator skills will be on this calculator. Students will **NOT** be able to use a graphing calculator that can download documents from computers such as the TI-nspire CX or any graphing calculator that says CAS (Computer Algebra System).

1. Order of Operations – Simplify each expression

a) $16 \div 2 - 5$

b) $4 - 24 \div 8$

c) $15 - 2(5 - 2)$

d) $12 \div 4 - 6 \div 3$

e) $17 + 8 \div 2 + 3$

f) $(17 + 8) \div (2 + 3)$

g) -3^4

h) $(-3)^4$

2. Simplify each algebraic expression

a) $-5a + 3b - 4a - 4b$

b) $3(2x + 1) - 8$

c) $3(5y + x) - x$

d) $3y - (4x + 6y)$

e) $3x - 7(2x - 13)$

f) $-(m + n) - 2(m - 3n)$

3. Evaluate each expression when $x = 16$, $y = -5$, and $z = 27$.

a) $3\sqrt{x} - 7y$

b) $-4y^2$

c) $\frac{\sqrt[3]{z}}{y} - \frac{y}{x}$

4. Solve each equation. Write answers as integers or simplified fractions. Check your answers.

a) $4x + 5 = x - 3$

b) $13y + 48 = 8y - 47$

c) $\frac{3}{4}x + \frac{1}{4} = 9$

d) $3y - (4x + 6y)$

e) $3x - 7(2x - 13)$

f) $-(m + n) - 2(m - 3n)$

g) $\frac{5}{12}x - 12 = 48$

h) $\frac{x+3}{2} = x - 4$

i) $8\left(\frac{3}{4}x + \frac{1}{2}\right) = 5x$

j) $0.7z + 0.3z = 2z - 4$

k) $4w - 2(1 - w) = -38$

l) $7(a + 1) - 3a = 5 + 4(2a - 1)$

5. Solve each literal equation for the specified variable.

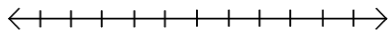
a) $S = 180(n - 2)$ for n

b) $R = \frac{s^2}{A}$ for A

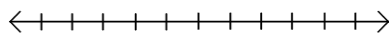
c) $A = \frac{1}{2}h(b_1 + b_2)$ for b_1

6. Solve each linear inequality. Write the solutions as an inequality(s). Graph the solution on a number line. HINT: Multiplying or dividing by a negative number reverses the inequality symbol.

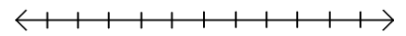
a) $3x - 5 > 10$



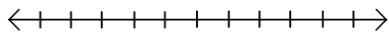
b) $7x - 2 \leq 3x + 4$



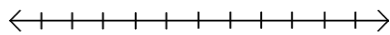
c) $6 - 7x > -8$



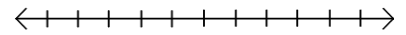
d) $4 - 2(x + 1) \leq -3$



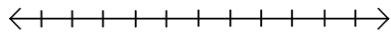
e) $\frac{2x-3}{5} \geq \frac{x}{2}$



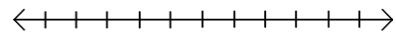
f) $-5 < 2x + 1 < 7$



g) $x - 2 \geq -6$ and $5 + x \leq 7$



h) $3x \leq -6$ or $4x - 3 \geq 9$



7. Solve for x . Show all work.

a) $\frac{8-4x}{6} = \frac{2x}{5}$

b) $\frac{4x-1}{21} = \frac{x}{6}$

c) $\frac{x+4}{-4} = \frac{3x}{36}$

The **absolute value** of x denoted $|x|$ is the distance from x to zero on the number line where x is any number.

When solving an **absolute value equation**, remember: If $a > 0$ and $|x| = a$, then $x = a$ or $x = -a$. Write the two equations and solve them both for x .

8. Solve each absolute value equation.

a) $|x| = 5$

b) $|2x + 3| = 4$

c) $|4x - 3| - 9 = 3$

Properties of Exponents: For all nonzero real numbers a and b , and all integers m and n .

Product of Powers: $a^m \cdot a^n = a^{m+n}$

Power of a Product: $(ab)^m = a^m a^n$

Quotient of Powers: $\frac{a^m}{a^n} = a^{m-n}$

Power of a Quotient: $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

Power of a Power: $(a^m)^n = a^{mn}$

Negative Exponents: $a^{-n} = \frac{1}{a^n}$ OR $\frac{1}{a^{-n}} = a^n$

9. Simplify the following expressions. Write the expression with positive exponents.

a) $(5a^2)(4a^5)$

b) $(2a^2bc^3)(-5ab^4c^3)$

c) $2(r^2)^4$

d) $(2xy^{-2})^3$

e) $(-3x^4y^2)^3$

f) $\left(\frac{4w^2}{6w^5}\right)^3$

g) $7a^{-2}b^4$

h) $\frac{18s^2t^{-5}}{21s^7t^2}$

Slope (m) of a line that passes through the points (x_1, y_1) and (x_2, y_2)	Slope-Intercept Form of a Line	Point-Slope Form of a Line	Standard Form of a Line
$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$	$y = mx + b$	$y - y_1 = m(x - x_1)$	$Ax + By = C$

10. Find the slope of the line containing each point. **Integers or improper fractions only.** No decimals or mixed numbers will be accepted.

a) $(3, 4), (-1, -2)$

b) $(-1, 1), (5, -7)$

11. Write the equation of the line in slope-intercept form given certain conditions. No decimals or mixed numbers will be accepted. Use only improper fractions when fractions are necessary.

a) slope of $\frac{2}{3}$ going through the point $(-1, -8)$.

b) contains the points $(-3, 4)$ and $(5, -2)$.

c) slope of zero and contains the point $(-2, 5)$.

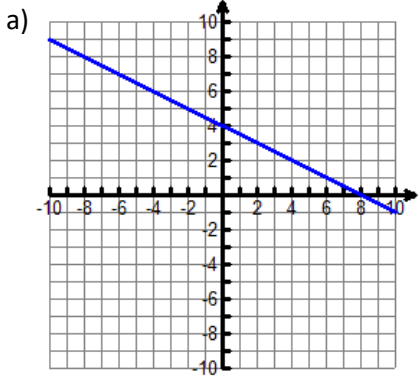
d) undefined slope and contains the point $(-8, -2)$.

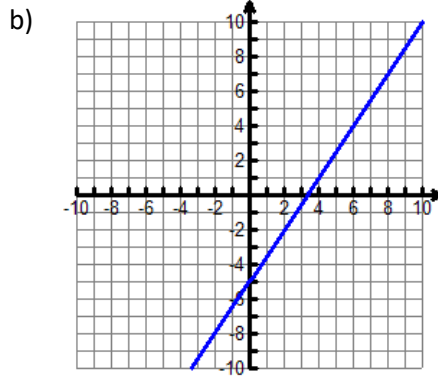
e) Write the equation of a line parallel to the line $4x - 3y = 10$ passing through the point $(-1, 8)$.

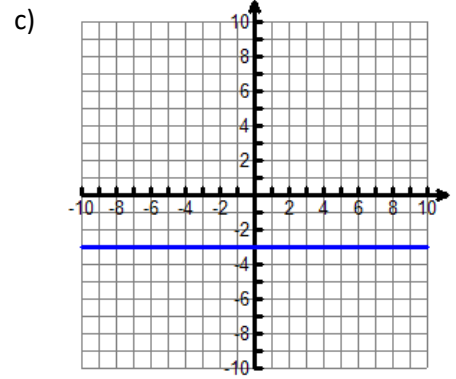
f) Write the equation of a line perpendicular to the line $3x + 5y = 12$ passing through the point $(7, -2)$.

g) Write the equation of a line perpendicular to the line $x = 5$ that contains the point $(2, -5)$.

12. Write an equation for each line in point-slope form, $y - y_1 = m(x - x_1)$, for the following graphs. Write your equations on the lines provided below.





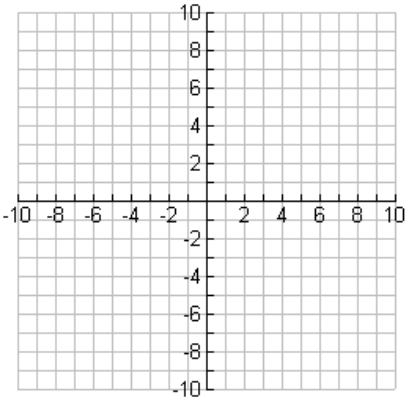


13. Find the slope, x-intercept and y-intercept of each equation and write them on the lines below. Graph each equation by plotting 3 points. Label 3 coordinate points on the graph.

a) $y = -\frac{2}{5}x + 4$

b) $2x - 3y = 9$

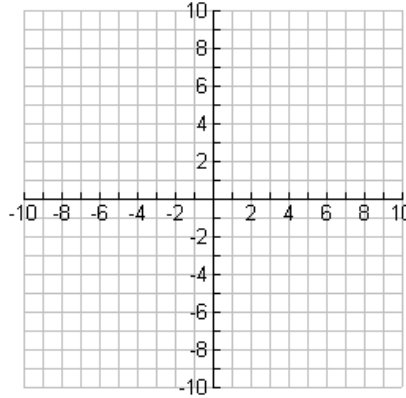
c) $-\frac{2}{3}x - \frac{3}{4}y = 6$



Slope _____

x-int _____

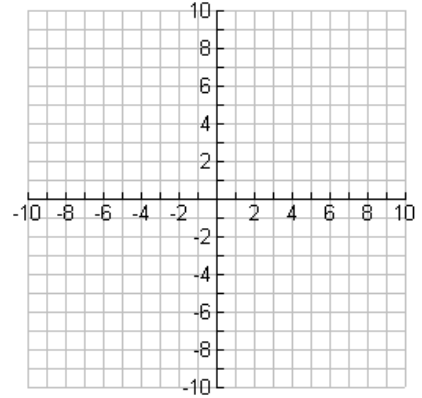
y-int _____



Slope _____

x-int _____

y-int _____



Slope _____

x-int _____

y-int _____

14. Factor each of the quadratic expressions.

a) $x^2 + 7x + 10$

b) $5x^2 - 15x$

c) $3x^2 + 21x + 18$

d) $16x^2 - 25$

e) $3x^2 + 4x - 15$

f) $12x^2 - 5x - 3$

g) $25x^2 + 30x + 9$

h) $x^2 - 14x + 49$

i) $2x^3 - 4x^2 + 3x - 6$