# HONORS ALGEBRA 2 SUMMER MATH PACKET

Summer Math Packet Overview:

This summer math packet is designed for students who are enrolled in Honors Algebra 2. It covers a wide scope of material that are all fundamental algebraic skills needed to be prepared for class on day 1. There is a list of websites/ resources that I recommend you use if you struggling with a concept and I will also be available during a portion of the summer at the school for you to come ask questions (more information to come on that). I do not expect you to know how to do every single problem or get every single problem correct. What I do expect is you to attempt every single problem and give it your best effort to complete them. Show all your work so that when we review the problems you can see where you went right or wrong. This packet is due on the first day of school. If you fail to turn it in on the first day, you may turn it in on day 2 for half credit. We will spend either the $2^{nd}$ or $3^{rd}$ day of school reviewing the packet (more details to come). We will also be having a test on these concepts at the end of the first week of school.

List of Lessons:

1. Order of Operations
2. Solving Equation
3. Operations with Polynomials
4. Simplify Exponents
5. Solving Quadratic Equations
6. Slope
7. Writing Linear Equations
8. Simplifying Radicals
9. Solving Systems of Equations
10. Algebraic Word Problems

Name : _____ Score : _____

Teacher : _____ Date : _____

# Advanced Order of Operations

**Evaluate each expression.**

1) $\left[\{(-78) \div (-13)\} - 8\right] \cdot 2 + 2$

2) $5 - (-4) \cdot \left[2 - \{5 + (-4)\}\right]$

3) $\left[8 + \{14 \div 7\}\right] \cdot 3 - 6$

4) $\left[\{66 \div 11\} - 6\right] \cdot 10 + 10$

5) $\left[(-6) - \{(-10) \div (-5)\}\right] \cdot (-3) + (-3)$

6) $\left[\{3 + 10\} \cdot 5\right] - 3 + 10$

7) $\left[(-11) - \{(-18) \div (-9)\}\right] \cdot (-9) + 9$

8) $\left[\{(-3) + (-10)\} \cdot (-4)\right] - (-3) + (-10)$

9) $\left[8 + \{14 \div 7\}\right] \cdot 5 - 9$

10) $\left[(-3) - \{(-11) - (-3)\}\right] \cdot ((-3) - (-11))$

11) $(-10) - (-9) \cdot \left[(-5) - \{(-10) + (-9)\}\right]$

12) $\left[(-6) + \{(-10) \div (-5)\}\right] \cdot (-5) - (-2)$

Directions: Complete #'s 11 – 28 odd. Solve the equation. Show your work!! If you want extra practice or are struggling I HIGHLY recommend completing the even problems as well ☺

**11.** $3x = 24$

**12.** $4x = -16$

**13.** $3t - 4 = 8$

**14.** $2t - 9 = 3$

**15.** $2x - 3 = 4x - 5$

**16.** $4 - 2x = 3x - 6$

**17.** $4 - 3y = 2(y + 4)$

**18.** $4(y - 2) = 5y$

**19.** $\frac{1}{2}x = \frac{7}{8}$

**20.** $\frac{2}{3}x = \frac{4}{5}$

**21.** $\frac{1}{2}x + \frac{1}{3} = 1$

**22.** $\frac{1}{3}x + \frac{1}{4} = 1$

**23.** $2(3 - 4z) - 5(2z + 3) = z - 17$

**24.** $3(5z - 3) - 4(2z + 1) = 5z - 2$

**25.** $\frac{2x - 3}{4} + 5 = 3x$

**26.** $2x - 4 = \frac{4x - 5}{3}$

**27.** $\frac{t + 5}{8} - \frac{t - 2}{2} = \frac{1}{3}$

**28.** $\frac{t - 1}{3} + \frac{t + 5}{4} = \frac{1}{2}$

Directions: Complete #'s 15 – 31 odd by multiplying the polynomials. If you want extra practice it is highly encouraged to complete the even problems as well.

15) $(6x-7)(4x+1)$

16) $(5x-6)(4x-1)$

17) $(5x+y)(6x-4y)$

18) $(2u+3v)(8u-7v)$

19) $(x+3y)(3x+4y)$

20) $(8u+6v)(5u-8v)$

21) $(7x+5y)(8x+3y)$

22) $(5a+8b)(a-3b)$

23) $(r-7)(6r^2-r+5)$

24) $(4x+8)(4x^2+3x+5)$

25) $(6n-4)(2n^2-2n+5)$

26) $(2b-3)(4b^2+4b+4)$

27) $(6x+3y)(6x^2-7xy+4y^2)$

28) $(3m-2n)(7m^2+6mn+4n^2)$

29) $(8n^2+4n+6)(6n^2-5n+6)$

30) $(2a^2+6a+3)(7a^2-6a+1)$

31) $(5k^2+3k+3)(3k^2+3k+6)$

32) $(7u^2+8uv-6v^2)(6u^2+4uv+3v^2)$

Directions: Complete #'s 5 – 14 odd by simplifying each expression by either adding or subtracting the polynomials.

5) $(3a^2+1)-(4+2a^2)$

6) $(4r^3+3r^4)-(r^4-5r^3)$

7) $(5a+4)-(5a+3)$

8) $(3x^4-3x)-(3x-3x^4)$

9) $(-4k^4+14+3k^2)+(-3k^4-14k^2-8)$

10) $(3-6n^5-8n^4)-(-6n^4-3n-8n^5)$

11) $(12a^5-6a-10a^3)-(10a-2a^5-14a^4)$

12) $(8n-3n^4+10n^2)-(3n^2+11n^4-7)$

13) $(-x^4+13x^5+6x^3)+(6x^3+5x^5+7x^4)$

14) $(9r^3+5r^2+11r)+(-2r^3+9r-8r^2)$

Directions: Complete #'s 1 – 38 odd by simplifying exponential expressions using exponent rules. If you want extra practice, it is highly encouraged you complete the even problems as well ☺

**Simplify:**

1. $3 \cdot 4^3$
2. $4x^3 \cdot 2x^3$
3. $x^5 \cdot x^3$
4. $2x^3 \cdot 2x^2$
5. $\frac{6^5}{6^3}$
6. $\frac{x^4}{x^7}$
7. $8^0$
8. $-(9x)^0$
9. $(y^4)^3$
10. $(x^2y)^4$
11. $\frac{6x^7}{2x^4}$
12. $\frac{8x^5}{4x^2}$
13. $(2cd^4)^2(cd)^5$
14. $(2fg^4)^4(fg)^6$
15. $\frac{x^5y^6}{xy^2}$
16. $\frac{x^2y^5}{xy^4}$
17. $\left(\frac{4x^5y}{16xy^4}\right)^3$
18. $\left(\frac{5x^3y}{20xy^5}\right)^4$
19. $y^{-7}$
20. $7^{-2}$
21. $\frac{1}{x^{-5}}$
22. $\frac{1}{2^{-4}}$
23. $x^5 \cdot x^{-1}$
24. $x^{-6}$
25. $x^9 \cdot x^{-7}$
26. $(j^{-13})(j^4)(j^6)$
27. $\frac{x^{-1}}{x^{-8}}$
28. $\frac{52x^6}{13x^{-7}}$
29. $f^{-3}(f^2)(f^{-3})$
30. $\frac{x^{-4}}{x^{-9}}$
31. $\frac{24x^6}{12x^{-8}}$
32. $\frac{3x^2y^{-3}}{12x^6y^3}$
33. $(2x^3y^{-3})^{-2}$
34. $\frac{2x^4y^{-4}}{8x^7y^3}$
35. $(4x^4y^{-4})^3$
36. $5x^2y(2x^4y^{-3})$
37. $\left(\frac{-7a^2b^3c^0}{3a^3b^4c^3}\right)^{-4}$
38. $\left(\frac{-2a^3b^2c^0}{3a^2b^3c^7}\right)^{-2}$

Directions: Complete #'s 1 – 18 odd by **FACTORING** and complete #'s 1 – 18 even by using the **QUADRATIC FORMULA**.

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1) $x^2 - 9x + 18 = 0$

2) $x^2 + 5x + 4 = 0$

3) $n^2 - 64 = 0$

4) $b^2 + 5b = 0$

5) $35n^2 + 22n + 3 = 0$

6) $15b^2 + 4b - 4 = 0$

7) $7p^2 - 38p - 24 = 0$

8) $3x^2 + 14x - 49 = 0$

9) $3k^2 - 18k - 21 = 0$

10) $6k^2 - 42k + 72 = 0$

11) $x^2 = 11x - 28$

12) $k^2 + 15k = -56$

13) $3m^2 = -16m - 21$

14) $8x^2 = 30 + 43x$

15) $x^2 + 17x + 49 = 3x$

16) $m^2 = 2m$

17) $2k^2 - 14 = -3k$

18) $3v^2 + 36v + 49 = 8v$

Directions: Complete the following problems on all things slope ☺

In Exercises 3–6, find the slope of the line through the pair of points.

**3.** $(-3, 5)$ and $(4, 9)$

**4.** $(-2, 1)$ and $(5, -3)$

**5.** $(-2, -5)$ and $(-1, 3)$

**6.** $(5, -3)$ and $(-4, 12)$

In Exercises 7–10, find the value of $x$ or $y$ so that the line through the pair of points has the given slope.

| | Points | Slope |
|---|---|---|
| **7.** | $(x, 3)$ and $(5, 9)$ | $m = 2$ |
| **8.** | $(-2, 3)$ and $(4, y)$ | $m = -3$ |
| **9.** | $(-3, -5)$ and $(4, y)$ | $m = 3$ |
| **10.** | $(-8, -2)$ and $(x, 2)$ | $m = 1/2$ |

In Exercises 21–26, find a slope-intercept form equation for the line.

**21.** The line through $(0, 5)$ with slope $m = -3$

**22.** The line through $(1, 2)$ with slope $m = 1/2$

**23.** The line through the points $(-4, 5)$ and $(4, 3)$

**24.** The line through the points $(4, 2)$ and $(-3, 1)$

In Exercises 41–44, (a) find an equation for the line passing through the point and parallel to the given line, and (b) find an equation for the line passing through the point and perpendicular to the given line. Support your work graphically.

| | Point | Line |
|---|---|---|
| **41.** | $(1, 2)$ | $y = 3x - 2$ |
| **42.** | $(-2, 3)$ | $y = -2x + 4$ |
| **43.** | $(3, 1)$ | $2x + 3y = 12$ |
| **44.** | $(6, 1)$ | $3x - 5y = 15$ |

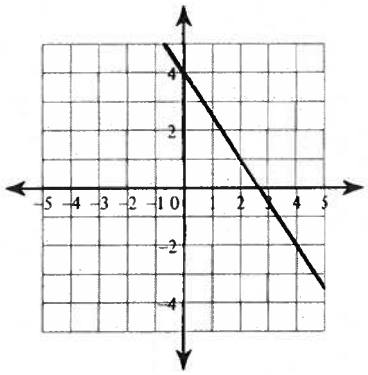
Kuta Software - Infinite Pre-Algebra Name_____

# Writing Linear Equations

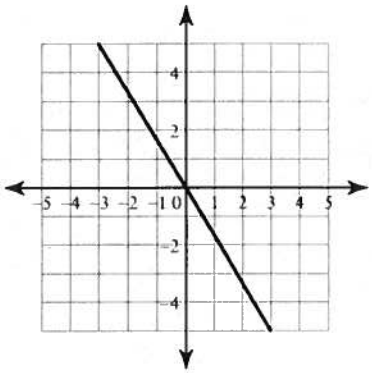
Date_____ Period____

**Write the slope-intercept form of the equation of each line.**

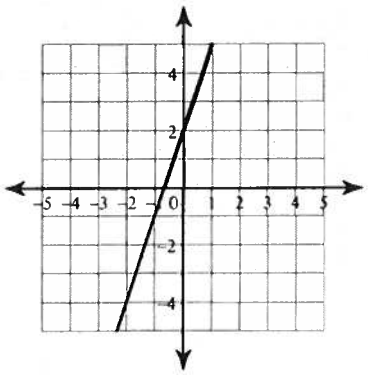
1)



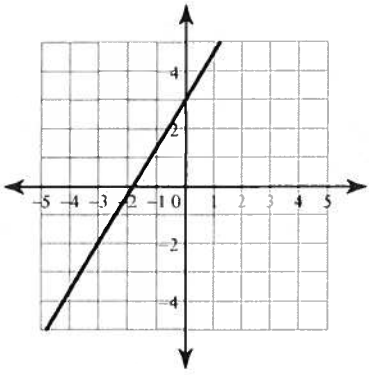
2)



3)



4)



Directions: Simplify the following radicals.

3) $\sqrt{512k^2}$

4) $\sqrt{512m^3}$

5) $\sqrt{216k^4}$

6) $\sqrt{100v^3}$

7) $\sqrt{80p^3}$

8) $\sqrt{45p^2}$

Directions: Simplify the following radicals by using the appropriate operation.

5) $-4\sqrt{15} \cdot -\sqrt{3}$

6) $\sqrt{20x^2} \cdot \sqrt{20x}$

7) $\sqrt{15n^2} \cdot \sqrt{10n^3}$

8) $\sqrt{18a^2} \cdot 4\sqrt{3a^2}$

9) $-3\sqrt{7r^3} \cdot 6\sqrt{7r^2}$

10) $-4\sqrt{28x} \cdot \sqrt{7x}$

11) $\sqrt{3}(5 + \sqrt{3})$

12) $2\sqrt{5}(\sqrt{6} + 2)$

3) $-11\sqrt{21} - 11\sqrt{21}$

4) $-9\sqrt{15} + 10\sqrt{15}$

5) $-10\sqrt{7} + 12\sqrt{7}$

6) $-3\sqrt{17} - 4\sqrt{17}$

7) $-10\sqrt{11} - 11\sqrt{11}$

8) $-2\sqrt{3} + 3\sqrt{27}$

Directions: Solve the following system of equations by substitution.

1) $y = 6x - 11$
$-2x - 3y = -7$

2) $2x - 3y = -1$
$y = x - 1$

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

4) $-3x - 3y = 3$
$y = -5x - 17$

5) $y = -2$
$4x - 3y = 18$

6) $y = 5x - 7$
$-3x - 2y = -12$

Directions: Solve the following system of equations by elimination.

1) $-4x - 2y = -12$
$4x + 8y = -24$

2) $4x + 8y = 20$
$-4x + 2y = -30$

3) $x - y = 11$
$2x + y = 19$

4) $-6x + 5y = 1$
$6x + 4y = -10$

5) $-2x - 9y = -25$
$-4x - 9y = -23$

6) $8x + y = -16$
$-3x + y = -5$

Algebra 1 Name_____



# Unit 1 Word Problem Worksheet #1

Date_____ Period____

**Write an equation and solve. Show ALL work**

1) 5 less than 3 times a number $w$ is equal to 7 times the same number minus 3

2) Two-thirds of a number $n$ minus six is ten

3) 8 times a number $j$ is the same as 4 times the quantity $2j$ plus six.

**Establish a variable, write an equation, and solve. Show all work and label your answer.**

4) Mrs. Crambes paid $124 to get her car repaired. The total cost for the repairs was the sum of the amount paid for parts and labor. She was charged $76 for parts and $32 per hour for labor. How many hours did it take to fix her car?

5) Mr. Bryant is looking for a cell phone company. One company costs $38 per month, plus a charge of $0.12 per minute. Another charges $20 per month, but $0.21 per minute. After how many minutes is the cost the same for both companies?

6) For $360, a rock climbing gym offers a yearly membership where members can climb as many days as they want and pay $4 per day for equipment rentals. Nonmembers pay $10 per day to use the gym and $6 per day for equipment rentals. After how many days do nonmembers pay the same amount as members?

7) The length of a rectangle is 12 units longer than the width. The perimeter is 7 times the width. Find the length and width of the rectangle. (The perimeter is the sum of twice the length and twice the width of the rectangle).

8) Kevin's boat used 5 gallons of gasoline in 4 hours. At this rate, how many gallons of gas will the boat use in 10 hours?

9) Mr. Werner has 15 coins in his pocket. Some of them are nickels, and some of them are dimes. If the coins total to be $1.05, how many of his coins are nickels?

10) You work in the local mailroom at college. One of your duties is to sort local mail from all of the other mail. You can sort 8 pieces of mail in 10 seconds. How many pieces of mail should you be able to sort in 45 minutes?

11) A music downloading website reports that 5 out of every 7 songs downloaded are classified as pop music. According to this information, predict how many of the next 500 songs downloaded will be pop songs. Round your answer to the nearest whole number.