

Name: \_\_\_\_\_

## Incoming Honors 8th Grade Math Summer Work

### Directions:

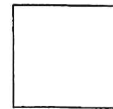
- Do your best on these assignments.
- In August, we'll have a quiz on summer work concepts during the first week of math class.
- You learned these concepts this year, so feel free to go back to old lesson videos on Classroom to help you remember processes if needed.
- Use the answer key on Classroom to check your answers over the summer. Fix anything that's wrong, and star any problems you don't understand so you remember your questions at school.
- Show all work clearly and step-by-step. Staple any separate work pages to the back of this packet. No shown work will result in no credit.
- Happy Summer! :)

Name: \_\_\_\_\_

Unit 1: Algebra Basics

Date: \_\_\_\_\_ Bell: \_\_\_\_\_

Homework 4: Order of Operations

**Directions:** Evaluate each expression using the order of operations.

1.  $17 - 5 \cdot 4 \div 2$

2.  $40 - 32 \div 8 + 5 \cdot -2$

3.  $35 - 14 \div 2 + 8^2$

4.  $(4 - 7)^2 - 6 \cdot 7 + 20$

5.  $2[18 - (5 + 3^2) \div 7]$

6.  $[(-5 + 1) \div 2]^3 - |-7|$

7.  $1 + (-2 - 5)^2 + (14 - 17) \cdot 4$

8.  $\frac{6(2 + 4) - 1}{2 \cdot 3 + 1}$

9.  $\frac{2^5 \div 8 + 3}{4 + 3}$

10.  $\frac{17 \cdot 5 - 3 \cdot 5}{3^2 + 1}$

11.  $\frac{13 + 7^2 \div 7}{9 - 20 \div 4 - 16}$

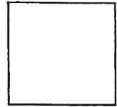
12.  $-|-16| \div \frac{(3^2 - 4)}{5 - 10}$

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Homework 5: Evaluating Expressions



| <b>Directions:</b> Evaluate each expression for the given variable values. |                                                              |
|----------------------------------------------------------------------------|--------------------------------------------------------------|
| 1. $n^2 - 3n + 8$ if $n = 4$                                               | 2. $\frac{x^2 - 4y}{2}$ if $x = 4$ and $y = -3$              |
| 3. $4 m - n $ if $m = -7$ and $n = 2$                                      | 4. $19 - x^2$ if $x = -5$                                    |
| 5. $s^2t - 10$ if $s = -8$ and $t = \frac{3}{4}$                           | 6. $4p^2 + 7q^3$ if $p = -3$ and $q = -2$                    |
| 7. $\frac{(a+b)^5}{a-2b^2}$ if $a = 6$ and $b = -8$                        | 8. $\frac{5c^2 - d^2 + 3}{2c - 4d}$ if $c = -1$ and $d = -4$ |
| 9. $-q^2 - r^2 + 3s$ if $q = 9$ , $r = -6$ , $s = -20$                     | 10. $3 x + y ^2 - (xy)^2$ if $x = 3$ and $y = -5$            |
| 11. $2x^2 - 5xy - y^3$ if $x = -3$ and $y = -2$                            | 12. $-a^2 + 7b^4 - 2c^3$ if $a = -4$ , $b = -2$ , $c = -3$   |

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Homework 7: Combining Like Terms

**Directions:** Simplify each expression by combining like terms.

1.  $8y - 9y$

2.  $3x - 7x + 1$

3.  $8a - 6 + a - 1$

4.  $-2y + 14 - 9y + 5$

5.  $-x - 2 + 15x$

6.  $-7w - 5 - 7w + 9$

7.  $8d - 4 - d - 2$

8.  $40 - 9x + 4x + 5$

9.  $9a + 8 - 2a - 3 - 5a$

10.  $4xy - 6xy + 5y - 9x$

11.  $7x + 2y + 5 - 5x + 9y - 1$

12.  $-5f - 7g + f - 5g - 4 + f$

13.  $-6 + 3a - b - 4a + 4b + 5$

14.  $6n^2 - 2n - 3 + 5n^2 - 9n - 6$

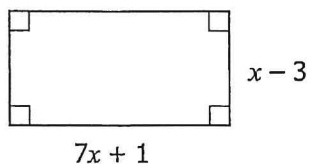
15.  $8c^2 - c + 3 + 2c^2 - c + 2$

16.  $-12x^2y - 3x^2y$

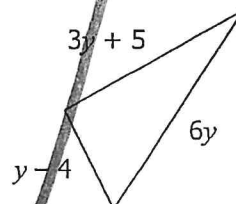
17.  $6a^2b^2 + 3ab^2 - a^2b^2 - 4ab^2$

18.  $19x^2y - 4xy^2 + 5xy^2 - 16x^2y$

19. Write the perimeter of the rectangle as a simplified expression.



20. Write the perimeter of the triangle as a simplified expression.

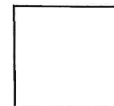


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Homework 8: Simplifying Expressions

**Directions:** Simplify each expression by distributing.

1.  $8(x + 5) =$  \_\_\_\_\_

2.  $3(2y - 7) =$  \_\_\_\_\_

3.  $-2(3m + 9) =$  \_\_\_\_\_

4.  $-6(z - 1) =$  \_\_\_\_\_

5.  $-(5x + 1) =$  \_\_\_\_\_

6.  $-(x + 4) =$  \_\_\_\_\_

7.  $b(a - 6) =$  \_\_\_\_\_

8.  $7a(3b - 2c + 4) =$  \_\_\_\_\_

9.  $\frac{1}{2}(8x + 2) =$  \_\_\_\_\_

10.  $\frac{2}{3}\left(\frac{1}{4}x - 6\right) =$  \_\_\_\_\_

**Directions:** Simplify each expression by distributing and combining like terms.

11.  $-7(w - 4) + 3w - 27$

12.  $6(x + 1) - 5(x + 2)$

13.  $-5(k + 6) + 7(k - 4)$

14.  $8(x + 5) - 4(x + 4)$

15.  $-9(m + 2) + 4(6 - 7m)$

16.  $-3(-9v - 4) - 2(v - 2)$

17.  $-4(8 - c) - (3c + 7)$

18.  $6(p + 6) - (p - 6)$

19.  $21 - 8(w + 3) + 3 + 7w$

20.  $\frac{1}{2}\left(\frac{3}{5}x - 8\right) + \frac{7}{4}\left(\frac{2}{5}x + 4\right)$

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**Homework 9:** Translating Expressions  
Equations, & Inequalities

| <b>Directions:</b> Translate each expression. |                                        |
|-----------------------------------------------|----------------------------------------|
| 1. "the sum of a number and 4."               | 2. "the quotient of a number and -2."  |
| 3. "the product of a number and 5."           | 4. "the difference of a number and 7." |
| 5. "a number squared increased by 1"          | 6. "three less than twice a number"    |

| <b>Directions:</b> Translate each equation. <i><b>DO NOT SOLVE!</b></i> |                                                                                    |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 7. "twice a number divided by 6 is 42."                                 | 8. "two times the sum of number and 5 is 20"                                       |
| 9. "four times the difference of a number and 7 is 32"                  | 10. "one-third of a number is 12 less than the number itself"                      |
| 11. "ten increased by the quotient of a number and 2 is -15"            | 12. "one less than the product of a number and 3 is 5 more than the number itself" |

| <b>Directions:</b> Translate each inequality. |                                            |
|-----------------------------------------------|--------------------------------------------|
| 13. "a number less than 15"                   | 14. "a number greater than or equal to -3" |
| 15. "a number that is at least 90"            | 16. "a speed limit of 65 mph"              |
| 17. "a number that is no more than 20"        | 18. "a maximum number of 50"               |
| 19. "a minimum number of 10"                  | 20. "a number no less than 25"             |

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Homework 10: One &amp; Two-Step Equations

**Directions:** Solve each equation. **SHOW ALL STEPS!**

1.  $y - 17 = -37$

2.  $-12 + k = 18$

3.  $5m = -20$

4.  $\frac{x}{9} = 3$

5.  $\frac{4}{5}z = 16$

6.  $3p - 4 = 11$

7.  $-5a + 7 = -38$

8.  $31 - 12n = 211$

9.  $\frac{x}{3} - 15 = -7$

10.  $\frac{f}{-4} + 11 = 5$

11.  $\frac{4}{3}v + 25 = 33$

12.  $\frac{5}{8}c + 13 = 18$

13.  $-\frac{2}{3}w + 53 = 59$

14.  $11 = \frac{4}{5}h - 1$

15.  $-\frac{3}{8}r + 41 = -22$

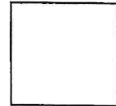
16.  $34 = 28 - \frac{2}{5}y$

17.  $\frac{n+4}{-2} = -9$

18.  $-5 = \frac{x-1}{8}$

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Unit 1: Algebra Basics

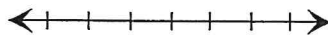


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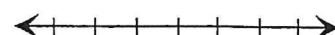
Homework 11: Solving & Graphing Inequalities

**Directions:** Solve and graph the following inequalities. **SHOW ALL STEPS!**

1.  $3x + 1 < 10$



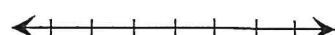
2.  $\frac{x}{3} + 10 \geq 15$



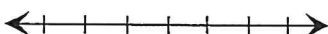
3.  $-2x + 22 < 18$



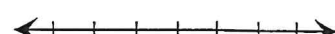
4.  $7x + 11 > -31$



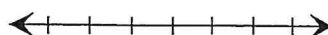
5.  $\frac{x}{5} - 3 \leq 6$



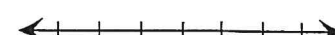
6.  $18 - 2x > 4$



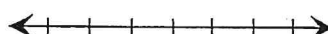
7.  $\frac{x}{-2} + 1 > 4$



8.  $4 - \frac{x}{7} \leq 5$



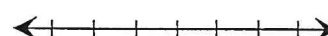
9.  $-3x - 4 < 8$



10.  $\frac{5}{8}x - 1 \geq 9$



11.  $-\frac{3}{4}x + 2 > 11$



12.  $\frac{x+15}{-3} > -7$



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Unit 2: Equations & Inequalities

Date: \_\_\_\_\_ Bell: \_\_\_\_\_

Homework 1: Multi-Step Equations



**\*\* This is a 2-page document! \*\***

**Directions:** Solve each equation. **SHOW ALL STEPS!**

1.  $-4x - 7 - 3x + 4 = 25$

2.  $-4(7a + 5) = -160$

3.  $3k + 2(5k - 3) = 7$

4.  $-79 = 7w + 3(4w - 1)$

5.  $9 - 4(2p - 1) = 41$

6.  $y - 3(2y - 7) = 76$

**7.**  $15 - 5(4c - 7) = 50$

**8.**  $-(6h + 7) + 8 = -19$

**9.**  $-\frac{1}{3}(9x + 42) - 5x = -70$

**10.**  $8 = -18 + \frac{3}{8}(16 - 40n)$

**11.**  $2(5v + 3) - 4(7v + 1) = -88$

**12.**  $7(3r - 1) - (r + 5) = -52$

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Unit 2: Equations & Inequalities

Date: \_\_\_\_\_ Bell: \_\_\_\_\_

Homework 2: Variables on Both Sides

**\*\* This is a 2-page document! \*\***

**Directions:** Solve each equation. **SHOW ALL STEPS!**

1.  $4x + 1 = 2x - 5$

2.  $y - 3 = -3y - 43$

3.  $7 - 14m = 2m - 5$

4.  $-10b + 5 = 7b + 5$

5.  $r + 15 = 4r - 6$

6.  $10 - 2v = -5v - 50$

**7.**  $3(5y + 1) = 18y$

**8.**  $4 - 3x = 8 - 4x$

**9.**  $8(2w - 2) = 7(3w + 2)$

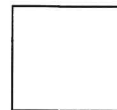
**10.**  $3(5x + 2) = 2(3x - 6)$

**11.**  $6(m - 1) = 3(3m + 5)$

**12.**  $7(p + 3) + 9 = 5(p - 2) - 3p$

Name: \_\_\_\_\_

Unit 2: Equations &amp; Inequalities



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Homework 3: No Solution/Infinite Solution

**Directions:** Solve each equation. **SHOW ALL STEPS!**

1.  $2(n + 2) = 4n + 1 - 2n$

2.  $-15 - 3w = 4w - 2w$

3.  $2(x + 4) = 4x + 3 - 2x + 5$

4.  $4(2r - 1) = -2(3r + 16)$

5.  $3a - 6a + 2 = 8a + 20 - 5a$

6.  $-(v + 4) + 5 = 4v + 1 - 5v$

7.  $8 - 6m = 4m + 48$

8.  $11 + 3p - 7 = 6p + 5 - 3p$

9.  $4y = 38 - \frac{1}{2}(4y + 16)$

10.  $8x + 11 = 2(4x - 7) + 25$

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Homework 4: Order of Operations

**Directions:** Evaluate each expression using the order of operations.

1.  $17 - 5 \cdot 4 \div 2$

$17 - 20 \div 2$

$17 - 10 = \boxed{7}$

2.  $40 - 32 \div 8 + 5 \cdot -2$

$40 - 4 + (-10)$

$36 - 10 = \boxed{26}$

3.  $35 - 14 \div 2 + 8^2$

$35 - 7 + 64$

$28 + 64 = \boxed{92}$

4.  $(4 - 7)^2 - 6 \cdot 7 + 20$

$(-3)^2 - 42 + 20$

$9 - 42 + 20$

$-33 + 20 = \boxed{-13}$

5.  $2[18 - (5 + 3^2) \div 7]$

$2[18 - (5 + 9) \div 7]$

$2[18 - 14 \div 7]$

$2[18 - 2] = 2(16) = \boxed{32}$

6.  $[(-5 + 1) \div 2]^3 - |-7|$

$[(-4) \div 2]^3 - 7$

$[-2]^3 - 7$

$-8 - 7 = \boxed{-15}$

7.  $1 + (-2 - 5)^2 + (14 - 17) \cdot 4$

$1 + (-7)^2 + (-3) \cdot 4$

$1 + 49 + (-12)$

$50 - 12 = \boxed{38}$

8.  $\frac{6(2+4)-1}{2 \cdot 3+1}$

$\frac{6(6)-1}{6+1} = \frac{36-1}{7} = \frac{35}{7}$

$= \boxed{5}$

9.  $\frac{2^5 \div 8 + 3}{4 + 3}$

$\frac{32 \div 8 + 3}{7} = \frac{4 + 3}{7} = \frac{7}{7} = \boxed{1}$

10.  $\frac{17 \cdot 5 - 3 \cdot 5}{3^2 + 1}$

$\frac{85 - 15}{9 + 1} = \frac{70}{10} = \boxed{7}$

11.  $\frac{13 + 7^2 \div 7}{9 - 20 \div 4 - 16}$

$\frac{13 + 49 \div 7}{9 - 5 - 16} = \frac{13 + 7}{4 - 16} = \frac{20}{-12}$

$= -\frac{5}{3} = -1\frac{2}{3} = -1.\bar{6}$

12.  $-|-16| + \frac{(3^2 - 4)}{5 - 10}$

$-16 \div \frac{9 - 4}{-5} = -16 \div \frac{-5}{-5}$

$= -16 \div -1 = \boxed{16}$

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Homework 5: Evaluating Expressions

**Directions:** Evaluate each expression for the given variable values.

1.  $n^2 - 3n + 8$

if  $n = 4$ 

$(4)^2 - 3(4) + 8$

$16 - 12 + 8$

$4 + 8 = \boxed{12}$

2.  $\frac{x^2 - 4y}{2}$

if  $x = 4$  and  $y = -3$ 

$$\frac{(4)^2 - 4(-3)}{2} = \frac{16 + 12}{2} = \frac{28}{2}$$

$$= \boxed{14}$$

3.  $4|m - n|$

if  $m = -7$  and  $n = 2$ 

$4|(-7) - 2|$

$4|-9|$

$4(9) = \boxed{36}$

4.  $19 - x^2$

if  $x = -5$ 

$19 - (-5)^2$

$19 - 25 = \boxed{-6}$

5.  $s^2t - 10$

if  $s = -8$  and  $t = \frac{3}{4}$ 

$(-8)^2(3/4) - 10$

$64(3/4) - 10$

$48 - 10 = \boxed{38}$

6.  $4p^2 + 7q^3$

if  $p = -3$  and  $q = -2$ 

$4(-3)^2 + 7(-2)^3$

$4(9) + 7(-8)$

$36 - 56 = \boxed{-20}$

7.  $\frac{(a+b)^5}{a-2b^2}$

if  $a = 6$  and  $b = -8$ 

$$\frac{(6+(-8))^5}{6-2(-8)^2} = \frac{(-2)^5}{6-2(64)} = \frac{-32}{6-128}$$

$$= \frac{-32}{-122} = \frac{16}{61} = .26$$

8.  $\frac{5c^2 - d^2 + 3}{2c - 4d}$

if  $c = -1$  and  $d = -4$ 

$$\frac{5(-1)^2 - (-4)^2 + 3}{2(-1) - 4(-4)} = \frac{5 - 16 + 3}{-2 + 16}$$

$$= \frac{-8}{14} = \frac{-4}{7} = -0.57$$

9.  $-q^2 - r^2 + 3s$

if  $q = 9$ ,  $r = -6$ ,  $s = -20$ 

$-(9)^2 - (-6)^2 + 3(-20)$

$-81 - 36 - 60$

$-117 - 60 = \boxed{-177}$

10.  $3|x + y|^2 - (xy)^2$

if  $x = 3$  and  $y = -5$ 

$3|3 + (-5)|^2 - (3 \cdot -5)^2$

$3|-2|^2 - (-15)^2$

$3(4) - 225$

$12 - 225 = \boxed{-213}$

11.  $2x^2 - 5xy - y^3$

if  $x = -3$  and  $y = -2$ 

$2(-3)^2 - 5(-3)(-2) - (-2)^3$

$2(9) + 15(-2) - (-8)$

$18 - 30 + 8$

$-12 + 8 = \boxed{-4}$

12.  $-a^2 + 7b^4 - 2c^3$

if  $a = -4$ ,  $b = -2$ ,  $c = -3$ 

$-(-4)^2 + 7(-2)^4 - 2(-3)^3$

$-16 + 7(16) - 2(-27)$

$-16 + 112 + 54$

$96 + 54 = \boxed{150}$

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Homework 7: Combining Like Terms

**Directions:** Simplify each expression by combining like terms.

1.  $8y - 9y$

$-y$

2.  $3x - 7x + 1$

$-4x + 1$

3.  $8a - 6 + a - 1$

$9a - 7$

4.  $-2y + 14 - 9y + 5$

$-11y + 19$

5.  $-x - 2 + 15x$

$14x - 2$

6.  $-7w - 5 - 7w + 9$

$-14w + 4$

7.  $8d - 4 - d - 2$

$7d - 6$

8.  $40 - 9x + 4x + 5$

$-5x + 45$

9.  $9a + 8 - 2a - 3 - 5a$

$2a + 5$

10.  $4xy - 6xy + 5y - 9x$

$-2xy - 9x + 5y$

11.  $7x + 2y + 5 - 5x + 9y - 1$

$2x + 11y + 4$

12.  $-5f - 7g + f - 5g - 4 + f$

$-3f - 12g - 4$

13.  $-6 + 3a - b - 4a + 4b + 5$

$-a + 3b - 1$

14.  $6n^2 - 2n - 3 + 5n^2 - 9n - 6$

$11n^2 - 11n - 9$

15.  $8c^2 - c + 3 + 2c^2 - c + 2$

$10c^2 - 2c + 5$

16.  $-12x^2y - 3x^2y$

$-15x^2y$

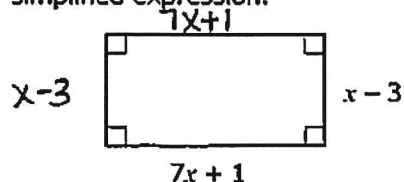
17.  $6a^2b^2 + 3ab^2 - a^2b^2 - 4ab^2$

$5a^2b^2 - ab^2$

18.  $19x^2y - 4xy^2 + 5xy^2 - 16x^2y$

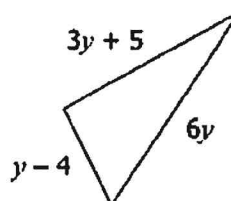
$3x^2y + xy^2$

19. Write the perimeter of the rectangle as a simplified expression.



$16x - 4$

20. Write the perimeter of the triangle as a simplified expression.



$10y + 1$

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Homework 8: Simplifying Expressions

**Directions:** Simplify each expression by distributing.

1.  $8(x + 5) = 8x + 40$

2.  $3(2y - 7) = 6y - 21$

3.  $-2(3m + 9) = -6m - 18$

4.  $-6(z - 1) = -6z + 6$

5.  $-(5x + 1) = -5x - 1$

6.  $-(x + 4) = -x - 4$

7.  $b(a - 6) = ab - 6b$

8.  $7a(3b - 2c + 4) = 21ab - 14ac + 28a$

9.  $\frac{1}{2}(8x + 2) = 4x + 1$

10.  $\frac{2}{3}\left(\frac{1}{4}x - 6\right) = \frac{1}{6}x - 4$

**Directions:** Simplify each expression by distributing and combining like terms

11.  $-7(w - 4) + 3w - 27$   
 $-7w + 28 + 3w - 27$   
 $= -4w + 1$

12.  $6(x + 1) - 5(x + 2)$   
 $6x + 6 - 5x - 10$   
 $= x - 4$

13.  $-5(k + 6) + 7(k - 4)$   
 $-5k - 30 + 7k - 28$   
 $= 2k - 58$

14.  $8(x + 5) - 4(x + 4)$   
 $8x + 40 - 4x - 16$   
 $= 4x + 24$

15.  $-9(m + 2) + 4(6 - 7m)$   
 $-9m - 18 + 24 - 28m$   
 $= -37m + 6$

16.  $-3(-9v - 4) - 2(v - 2)$   
 $27v + 12 - 2v + 4$   
 $= 25v + 16$

17.  $-4(8 - c) - (3c + 7)$   
 $-32 + 4c - 3c - 7$   
 $= c - 39$

18.  $6(p + 6) - (p - 6)$   
 $6p + 36 - p + 6$   
 $= 5p + 42$

19.  $21 - 8(w + 3) + 3 + 7w$   
 $21 - 8w - 24 + 3 + 7w$   
 $= -w$

20.  $\frac{1}{2}\left(\frac{3}{5}x - 8\right) + \frac{7}{4}\left(\frac{2}{5}x + 4\right)$   
 $\frac{3}{10}x - 4 + \frac{7}{10}x + 7 = x + 3$

Name: \_\_\_\_\_ Unit 1: Algebra Basics

Date: \_\_\_\_\_ Bell: \_\_\_\_\_ Homework 9: Translating Expressions  
Equations, & Inequalities

| Directions: Translate each expression.          |                                                         |
|-------------------------------------------------|---------------------------------------------------------|
| 1. "the sum of a number and 4."<br>$n+4$        | 2. "the quotient of a number and -2."<br>$\frac{n}{-2}$ |
| 3. "the product of a number and 5."<br>$5n$     | 4. "the difference of a number and 7."<br>$n-7$         |
| 5. "a number squared increased by 1"<br>$n^2+1$ | 6. "three less than twice a number"<br>$2n-3$           |

| Directions: Translate each equation. <b>DO NOT SOLVE!</b>                                |                                                                                                    |
|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 7. "twice a number divided by 6 is 42."<br>$\frac{2n}{6} = 42$                           | 8. "two times the sum of number and 5 is 20"<br>$2(n+5) = 20$ <del><math>x+5(2) = 20</math></del>  |
| 9. "four times the difference of a number and 7 is 32"<br>$4(n-7) = 32$                  | 10. "one-third of a number is 12 less than the number itself"<br>$\frac{1}{3}n = n-12$             |
| 11. "ten increased by the quotient of a number and 2 is -15"<br>$10 + \frac{n}{2} = -15$ | 12. "one less than the product of a number and 3 is 5 more than the number itself"<br>$3n-1 = 5+n$ |

| Directions: Translate each inequality.                |                                                           |
|-------------------------------------------------------|-----------------------------------------------------------|
| 13. "a number less than 15"<br>$n < 15$ $15 > n$      | 14. "a number greater than or equal to -3"<br>$n \geq -3$ |
| 15. "a number that is at least 90"<br>$n \geq 90$     | 16. "a speed limit of 65 mph"<br>$n \leq 65$              |
| 17. "a number that is no more than 20"<br>$n \leq 20$ | 18. "a maximum number of 50"<br>$n \leq 50$               |
| 19. "a minimum number of 10"<br>$n \geq 10$           | 20. "a number no less than 25"<br>$n \geq 25$             |

Name: \_\_\_\_\_

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Homework 10: One &amp; Two-Step Equations

**Directions:** Solve each equation. **SHOW ALL STEPS!**

$$1. \begin{array}{r} y - 17 = -37 \\ +17 \quad +17 \\ \hline y = -20 \end{array}$$

$$2. \begin{array}{r} -12 + k = 18 \\ +12 \quad +12 \\ \hline k = 30 \end{array}$$

$$3. \begin{array}{r} 5m = -20 \\ \div 5 \quad \div 5 \\ \hline m = -4 \end{array}$$

$$4. \begin{array}{r} \frac{x}{9} = 3 \cdot 9 \\ \hline x = 27 \end{array}$$

$$5. \begin{array}{r} \frac{4}{5}z = 16 \cdot \frac{5}{4} \\ \hline z = 20 \end{array}$$

$$6. \begin{array}{r} 3p - 4 = 11 \\ +4 \quad +4 \\ \hline 3p = 15 \\ \div 3 \quad \div 3 \\ \hline p = 5 \end{array}$$

$$7. \begin{array}{r} -5a + 7 = -38 \\ -7 \quad -7 \\ \hline -5a = -45 \\ \div -5 \quad \div -5 \\ \hline a = 9 \end{array}$$

$$8. \begin{array}{r} 31 - 12n = 211 \\ -31 \quad -31 \\ \hline -12n = 180 \\ \div -12 \quad \div -12 \\ \hline n = -15 \end{array}$$

$$9. \begin{array}{r} \frac{x}{3} - 15 = -7 \\ +15 \quad +15 \\ \hline 3 \cdot \frac{x}{3} = 8 \cdot 3 \\ \hline x = 24 \end{array}$$

$$10. \begin{array}{r} \frac{f}{-4} + 11 = 5 \\ -11 \quad -11 \\ \hline -4 \cdot \frac{f}{-4} = -6 \cdot -4 \\ \hline f = 24 \end{array}$$

$$11. \begin{array}{r} \frac{4}{3}v + 25 = 33 \\ -25 \quad -25 \\ \hline \frac{3}{4} \cdot \frac{4}{3}v = 8 \cdot \frac{3}{4} \\ \hline v = 6 \end{array}$$

$$12. \begin{array}{r} \frac{5}{8}c + 13 = 18 \\ -13 \quad -13 \\ \hline \frac{8}{5} \cdot \frac{5}{8}c = 5 \cdot \frac{8}{5} \\ \hline c = 8 \end{array}$$

$$13. \begin{array}{r} -\frac{2}{3}w + 53 = 59 \\ -53 \quad -53 \\ \hline -\frac{3}{2} \cdot -\frac{2}{3}w = 6 \cdot -\frac{3}{2} \\ \hline w = -9 \end{array}$$

$$14. \begin{array}{r} 11 = \frac{4}{5}h - 1 \\ +1 \quad +1 \\ \hline \frac{5}{4} \cdot 12 = \frac{4}{5}h \cdot \frac{5}{4} \\ \hline 15 = h \end{array}$$

$$15. \begin{array}{r} -\frac{3}{8}r + 41 = -22 \\ -41 \quad -41 \\ \hline -\frac{8}{3} \cdot -\frac{3}{8}r = -63 \cdot -\frac{8}{3} \\ \hline r = 168 \end{array}$$

$$16. \begin{array}{r} 34 = 28 - \frac{2}{5}y \\ -28 \quad -28 \\ \hline -\frac{5}{2} \cdot 6 = -\frac{2}{5}y \cdot -\frac{5}{2} \\ \hline -15 = y \end{array}$$

$$17. \begin{array}{r} \frac{2n+4}{-2} = -9 \cdot -2 \\ \hline n+4 = 18 \\ -4 \quad -4 \\ \hline n = 14 \end{array}$$

$$18. \begin{array}{r} -5 = \frac{x-1}{8} \cdot 8 \\ \hline -40 = x - 1 \\ +1 \quad +1 \\ \hline -39 = x \end{array}$$

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Unit 1: Algebra Basics

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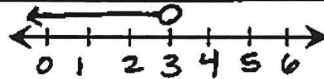
Homework 11: Solving &amp; Graphing Inequalities

**Directions: Solve and graph the following inequalities. SHOW ALL STEPS!**

1.  $3x + 1 < 10$

$$\begin{array}{r} -1 \quad -1 \\ 3x + 1 < 10 \\ \hline 3x < 9 \\ \hline \frac{3x}{3} < \frac{9}{3} \end{array}$$

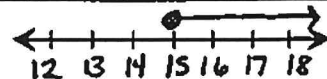
$$\boxed{x < 3}$$



2.  $\frac{x}{3} + 10 \geq 15$

$$\begin{array}{r} -10 \quad -10 \\ \frac{x}{3} + 10 \geq 15 \\ \hline \frac{x}{3} \geq 5 \cdot 3 \end{array}$$

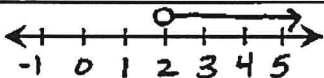
$$\boxed{x \geq 15}$$



3.  $-2x + 22 < 18$

$$\begin{array}{r} -22 \quad -22 \\ -2x + 22 < 18 \\ \hline -2x < -4 \\ \hline \frac{-2x}{-2} < \frac{-4}{-2} \end{array}$$

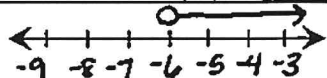
$$\boxed{x > 2}$$



4.  $7x + 11 > -31$

$$\begin{array}{r} -11 \quad -11 \\ 7x + 11 > -31 \\ \hline 7x > -42 \\ \hline \frac{7x}{7} > \frac{-42}{7} \end{array}$$

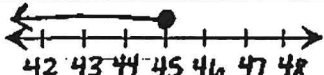
$$\boxed{x > -6}$$



5.  $\frac{x}{5} - 3 \leq 6$

$$\begin{array}{r} +3 \quad +3 \\ \frac{x}{5} - 3 \leq 6 \\ \hline \frac{x}{5} \leq 9 \cdot 5 \end{array}$$

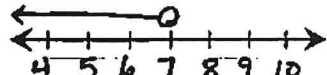
$$\boxed{x \leq 45}$$



6.  $18 - 2x > 4$

$$\begin{array}{r} -18 \quad -18 \\ 18 - 2x > 4 \\ \hline -2x > -14 \\ \hline \frac{-2x}{-2} > \frac{-14}{-2} \end{array}$$

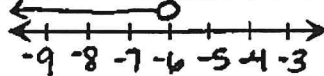
$$\boxed{x < 7}$$



7.  $\frac{x}{-2} + 1 > 4$

$$\begin{array}{r} -1 \quad -1 \\ \frac{x}{-2} + 1 > 4 \\ \hline \frac{x}{-2} > 3 \cdot -2 \end{array}$$

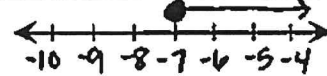
$$\boxed{x < -6}$$



8.  $4 - \frac{x}{7} \leq 5$

$$\begin{array}{r} -4 \quad -4 \\ 4 - \frac{x}{7} \leq 5 \\ \hline -\frac{x}{7} \leq 1 \cdot -7 \end{array}$$

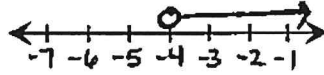
$$\boxed{x \geq -7}$$



9.  $-3x - 4 < 8$

$$\begin{array}{r} +4 \quad +4 \\ -3x - 4 < 8 \\ \hline -3x < 12 \\ \hline \frac{-3x}{-3} < \frac{12}{-3} \end{array}$$

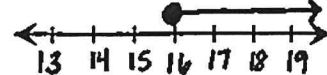
$$\boxed{x > -4}$$



10.  $\frac{5}{8}x - 1 \geq 9$

$$\begin{array}{r} +1 \quad +1 \\ \frac{5}{8}x - 1 \geq 9 \\ \hline \frac{5}{8}x \geq 10 \cdot \frac{8}{5} \end{array}$$

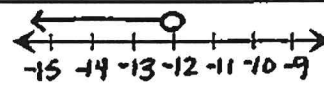
$$\boxed{x \geq 16}$$



11.  $-\frac{3}{4}x + 2 > 11$

$$\begin{array}{r} -2 \quad -2 \\ -\frac{3}{4}x + 2 > 11 \\ \hline -\frac{3}{4}x > 9 \cdot -\frac{4}{3} \end{array}$$

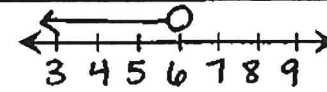
$$\boxed{x < -12}$$



12.  $\frac{x+15}{-3} > -7 \cdot -3$

$$\begin{array}{r} -15 \quad -15 \\ \frac{x+15}{-3} > -7 \cdot -3 \\ \hline x+15 < 21 \\ \hline \frac{x+15}{-3} < \frac{21}{-3} \end{array}$$

$$\boxed{x < 6}$$



Name: \_\_\_\_\_

Unit 2: Equations &amp; Inequalities

Date: \_\_\_\_\_ Bell: \_\_\_\_\_

Homework 1: Multi-Step Equations

**\*\* This is a 2-page document! \*\*****Directions:** Solve each equation. **SHOW ALL STEPS!**

1.  $-4x - 7 - 3x + 4 = 25$

$$\begin{array}{r} -7x - 3 = 25 \\ +3 \quad +3 \\ \hline -7x = 28 \\ \frac{-7}{-7} \quad \frac{-7}{-7} \end{array}$$

$$\boxed{x = -4}$$

2.  $-4(7a + 5) = -160$

$$\begin{array}{r} -28a - 20 = -160 \\ +20 \quad +20 \\ \hline -28a = -140 \\ \frac{-28}{-28} \quad \frac{-140}{-28} \end{array}$$

$$\boxed{a = 5}$$

3.  $3k + 2(5k - 3) = 7$

$$\begin{array}{r} 3k + 10k - 6 = 7 \\ 13k - 6 = 7 \\ +6 \quad +6 \\ \hline 13k = 13 \\ \frac{13}{13} \quad \frac{13}{13} \end{array}$$

$$\boxed{k = 1}$$

4.  $-79 = 7w + 3(4w - 1)$

$$\begin{array}{r} -79 = 7w + 12w - 3 \\ -79 = 19w - 3 \\ +3 \quad +3 \\ \hline -76 = 19w \\ \frac{-76}{19} \quad \frac{19}{19} \end{array}$$

$$\boxed{-4 = w}$$

5.  $9 - 4(2p - 1) = 41$

$$\begin{array}{r} 9 - 8p + 4 = 41 \\ -8p + 13 = 41 \\ -13 \quad -13 \\ \hline -8p = 28 \\ \frac{-8p}{-8} \quad \frac{28}{-8} \end{array}$$

$$\boxed{p = -\frac{7}{2}} = -3\frac{1}{2}$$

6.  $y - 3(2y - 7) = 76$

$$\begin{array}{r} y - 6y + 21 = 76 \\ -5y + 21 = 76 \\ -21 \quad -21 \\ \hline -5y = 55 \\ \frac{-5y}{-5} \quad \frac{55}{-5} \end{array}$$

$$\boxed{y = -11}$$

$$7. 15 - 5(4c - 7) = 50$$

$$15 - 20c + 35 = 50$$

$$-20c + 50 = 50$$

$$\begin{array}{r} -50 \quad -50 \\ \hline \end{array}$$

$$\frac{-20c}{-20} = \frac{0}{-20}$$

$$\boxed{c = 0}$$

$$8. -(6h + 7) + 8 = -19$$

$$-6h - 7 + 8 = -19$$

$$-6h + 1 = -19$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array}$$

$$\frac{-6h}{-6} = \frac{-20}{-6}$$

$$\boxed{h = \frac{10}{3}} = 3\frac{1}{3}$$

$$9. -\frac{1}{3}(9x + 42) - 5x = -70$$

$$-3x - 14 - 5x = -70$$

$$-8x - 14 = -70$$

$$\begin{array}{r} +14 \quad +14 \\ \hline \end{array}$$

$$\frac{-8x}{-8} = \frac{-56}{-8}$$

$$\boxed{x = 7}$$

$$10. 8 = -18 + \frac{3}{8}(16 - 40n)$$

$$8 = -18 + 6 - 15n$$

$$8 = -12 - 15n$$

$$\begin{array}{r} +12 \quad +12 \\ \hline \end{array}$$

$$\frac{20}{-15} = \frac{-15n}{-15}$$

$$\boxed{-\frac{4}{3} = n} = -1\frac{1}{3}$$

$$11. 2(5v + 3) - 4(7v + 1) = -88$$

$$10v + 6 - 28v - 4 = -88$$

$$-18v + 2 = -88$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array}$$

$$\frac{-18v}{-18} = \frac{-90}{-18}$$

$$\boxed{v = 5}$$

$$12. 7(3r - 1) - (r + 5) = -52$$

$$21r - 7 - r - 5 = -52$$

$$20r - 12 = -52$$

$$\begin{array}{r} +12 \quad +12 \\ \hline \end{array}$$

$$\frac{20r}{20} = \frac{-40}{20}$$

$$\boxed{r = -2}$$

Name: \_\_\_\_\_

Unit 2: Equations &amp; Inequalities

Date: \_\_\_\_\_ Bell: \_\_\_\_\_

Homework 2: Variables on Both Sides

**\*\* This is a 2-page document! \*\*****Directions:** Solve each equation. **SHOW ALL STEPS!**

1.  $4x + 1 = 2x - 5$

$$\begin{array}{r} -2x \quad -2x \\ 4x + 1 = 2x - 5 \\ -2x \quad -2x \\ \hline 2x + 1 = -5 \\ -1 \quad -1 \\ \hline 2x = -6 \\ \frac{2x}{2} = \frac{-6}{2} \end{array}$$

$$\boxed{x = -3}$$

2.  $y - 3 = -3y - 43$

$$\begin{array}{r} +3y \quad +3y \\ y - 3 = -3y - 43 \\ +3y \quad +3y \\ \hline 4y - 3 = -43 \\ +3 \quad +3 \\ \hline 4y = -40 \\ \frac{4y}{4} = \frac{-40}{4} \end{array}$$

$$\boxed{y = -10}$$

3.  $7 - 14m = 2m - 5$

$$\begin{array}{r} +14m \quad +14m \\ 7 - 14m = 2m - 5 \\ +14m \quad +14m \\ \hline 7 = 16m - 5 \\ +5 \quad +5 \\ \hline 12 = 16m \\ \frac{12}{16} = \frac{16m}{16} \end{array}$$

$$\boxed{\frac{3}{4} = m}$$

4.  $-10b + 5 = 7b + 5$

$$\begin{array}{r} +10b \quad +10b \\ -10b + 5 = 7b + 5 \\ +10b \quad +10b \\ \hline 5 = 17b + 5 \\ -5 \quad -5 \\ \hline 0 = 17b \\ \frac{0}{17} = \frac{17b}{17} \end{array}$$

$$\boxed{0 = b}$$

5.  $r + 15 = 4r - 6$

$$\begin{array}{r} -r \quad -r \\ r + 15 = 4r - 6 \\ -r \quad -r \\ \hline 15 = 3r - 6 \\ +6 \quad +6 \\ \hline 21 = 3r \\ \frac{21}{3} = \frac{3r}{3} \end{array}$$

$$\boxed{7 = r}$$

6.  $10 - 2v = -5v - 50$

$$\begin{array}{r} +5v \quad +5v \\ 10 - 2v = -5v - 50 \\ +5v \quad +5v \\ \hline 10 + 3v = -50 \\ -10 \quad -10 \\ \hline 3v = -60 \\ \frac{3v}{3} = \frac{-60}{3} \end{array}$$

$$\boxed{v = -20}$$

$$7. 3(5y + 1) = 18y$$

$$\begin{array}{r} 15y + 3 = 18y \\ -15y \quad -15y \\ \hline 3 = 3y \\ \frac{3}{3} \quad \frac{3}{3} \end{array}$$

$$\boxed{1 = y}$$

$$8. 4 - 3x = 8 - 4x$$

$$\begin{array}{r} +4x \quad +4x \\ 4 + x = 8 \\ -4 \quad -4 \\ \hline \boxed{x = 4} \end{array}$$

$$9. 8(2w - 2) = 7(3w + 2)$$

$$\begin{array}{r} 16w - 16 = 21w + 14 \\ -16w \quad -16w \\ \hline -16 = 5w + 14 \\ -14 \quad -14 \\ \hline -30 = 5w \\ \frac{-30}{5} \quad \frac{5w}{5} \end{array}$$

$$\boxed{-6 = w}$$

$$10. 3(5x + 2) = 2(3x - 6)$$

$$\begin{array}{r} 15x + 6 = 6x - 12 \\ -6x \quad -6x \\ \hline 9x + 6 = -12 \\ -6 \quad -6 \\ \hline 9x = -18 \\ \frac{9x}{9} \quad \frac{-18}{9} \end{array}$$

$$\boxed{x = -2}$$

$$11. 6(m - 1) = 3(3m + 5)$$

$$\begin{array}{r} 6m - 6 = 9m + 15 \\ -6m \quad -6m \\ \hline -6 = 3m + 15 \\ -15 \quad -15 \\ \hline -21 = 3m \\ \frac{-21}{3} \quad \frac{3m}{3} \end{array}$$

$$\boxed{-7 = m}$$

$$12. 7(p + 3) + 9 = 5(p - 2) - 3p$$

$$\begin{array}{r} 7p + 21 + 9 = 5p - 10 - 3p \\ 7p + 30 = 2p - 10 \\ -2p \quad -2p \\ \hline 5p + 30 = -10 \\ -30 \quad -30 \\ \hline 5p = -40 \\ \frac{5p}{5} \quad \frac{-40}{5} \end{array}$$

$$\boxed{p = -8}$$

Name: \_\_\_\_\_

Unit 2: Equations &amp; Inequalities

Date: \_\_\_\_\_ Bell: \_\_\_\_\_

Homework 3: No Solution/Infinite Solution

**Directions:** Solve each equation. **SHOW ALL STEPS!**

1.  $2(n+2) = 4n+1-2n$

$$\begin{array}{r} 2n+4 = 2n+1 \\ -2n \quad -2n \\ \hline 4 \neq 1 \end{array}$$

 $\boxed{\emptyset}$  no soln

2.  $-15-3w = 4w-2w$

$$\begin{array}{r} -15-3w = 2w \\ +3w \quad +3w \\ \hline -15 = 5w \\ \frac{-15}{5} = \frac{5w}{5} \end{array}$$

$\boxed{-3=w}$

3.  $2(x+4) = 4x+3-2x+5$

$$\begin{array}{r} 2x+8 = 2x+8 \\ -2x \quad -2x \\ \hline 8 = 8 \end{array}$$

infinite solns

 $\boxed{\mathbb{R}}$ 

4.  $4(2r-1) = -2(3r+16)$

$$\begin{array}{r} 8r-4 = -6r-32 \\ +6r \quad +6r \\ \hline 14r-4 = -32 \end{array}$$

$$\begin{array}{r} 14r-4 = -32 \\ +4 \quad +4 \\ \hline 14r = -28 \end{array}$$

$\boxed{r=-2}$

5.  $3a-6a+2 = 8a+20-5a$

$$\begin{array}{r} -3a+2 = 3a+20 \\ +3a \quad +3a \\ \hline 2 = 6a+20 \end{array}$$

$$\begin{array}{r} 2 = 6a+20 \\ -20 \quad -20 \\ \hline -18 = 6a \end{array}$$

$\frac{-18}{6} = \frac{6a}{6}$

$\boxed{a=-3}$

6.  $-(v+4)+5 = 4v+1-5v$

$$\begin{array}{r} -v-4+5 = -v+1 \\ -v+1 = -v+1 \end{array}$$

$$\begin{array}{r} -v+1 = -v+1 \\ +v \quad +v \\ \hline 1 = 1 \end{array}$$

$\boxed{\mathbb{R}}$

7.  $8-6m = 4m+48$

$$\begin{array}{r} 8-6m = 4m+48 \\ +6m \quad +6m \\ \hline 8 = 10m+48 \\ -48 \quad -48 \\ \hline -40 = 10m \end{array}$$

$\frac{-40}{10} = \frac{10m}{10}$

$\boxed{m=-4}$

8.  $11+3p-7 = 6p+5-3p$

$$\begin{array}{r} 3p+4 = 3p+5 \\ -3p \quad -3p \\ \hline 4 \neq 5 \end{array}$$

$\boxed{\emptyset}$  no soln

9.  $4y = 38 - \frac{1}{2}(4y+16)$

$$4y = 38 - 2y - 8$$

$$4y = -2y + 30$$

$$\begin{array}{r} 4y = -2y + 30 \\ +2y \quad +2y \\ \hline 6y = 30 \end{array}$$

$\frac{6y}{6} = \frac{30}{6}$

$\boxed{y=5}$

10.  $8x+11 = 2(4x-7)+25$

$$8x+11 = 8x-14+25$$

$$8x+11 = 8x+11$$

$$\begin{array}{r} 8x+11 = 8x+11 \\ -8x \quad -8x \\ \hline 11 = 11 \end{array}$$

$\boxed{\mathbb{R}}$