Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Expressions and Equations Study Guide**

***Two-Step Equations: Solve for the variable and check your answer. # 1-6***

|  |  |  |
| --- | --- | --- |
| 1. 2n – 3 = 15

 +3 +3 2n = 18 ÷2 ÷2  **n = 9** | 1. $\frac{n}{4}$ – 7 = 28

 + 7 +7$\frac{n}{4}$ = 35 4 x $\frac{n}{4}$ = 35 x 4**X = 140** | 1. -13a + 32 = 84

**A = -4** |
| 1. -8k + 15 = 71

**K = -7** | 1. -2(4x -7) + 5x = 17

Distribute: -8x + 14 + 5x = 17Combine like terms: -3x + 14 = 17 - 14 -14 -3x = 3 ÷(-3) ÷(-3) x = -1 | 6. Ted, Laura, and Sam went on a bird watching trip to a national park. If Ted identified a *total of 6* birds, Laura identified *2 times the number of birds Ted* did, and Sam identified *4 fewer birds than Laura*, how many birds did Sam identify?Ted = 6Laura = 2(ted) = 2(6) = 12Sam = Laura – 4 = 12 – 4 = 8 |
| 7. Translate the sentence into an expression*: ten more than the quotient of a number and 4*$\frac{x}{4}$ + 10 | 8. Translate the sentence into an expression: *4 less than the product 7 and a number*7p - 4 | 9. Jeremy works on computers and charges $14 per hour plus a one-time service fee of $5. If Jeremy worked on a computer for 2 ½ hours, how much should he charge the customer?Write an expression: 14h + 5Plug in 2 ½ or 2.5 per hour (h)14(2.5) + 5 = 40*He should charge the customer $40* |

***Combining Like Terms: Simplify the expression by combining like terms. Use Distributive Property if needed to help simplify.***

|  |  |
| --- | --- |
| 1. 7x + 20x + 7x – 9x

7 + 20 + 7 – 927 + 7 – 934 – 925Answer = 25x | 1. -4(3x + 6y) + 12x + 4y

Distribute: -12x – 24y + 12x + 4y -12x + 12x – 24y + 4y 0x – 24 y + 4y Answer: -20y |
| 1. – (x – 8y) – (x + 9y)

Distribute: (hint- when you see a negative sign outside the parentheses, change everything inside to its opposite! -x + 8y – x – 9y -1x – 1x + 8y – 9y(KCO!!) -1x + -1x + 8y + (-9y) Answer: -2x – 1y | 1. 5x – 3$x^{2}$ + 2xy + 31x – 18xy

– 3x2 + 5x + 31x + 2xy – 18xy– 3x2 + 36x + 2xy – 18xyAnswer: – 3x2 + 38x -16xy |

***Factoring: Find the GCF for the expression. Remember factoring is like doing the distributive property backwards. Remember: you can factor a number, a variable, or a number and variable!***

|  |  |
| --- | --- |
| 1. 3a – 3b

3( a-b)Use distributive property to check your answer! | 1. 4 x – 2z

2 (2x – z)Use distributive property to check your answer! |
| 1. 6m – 2mn

2m(3m – n)Use distributive property to check your answer! | 1. 7ab – 3a

a(7b – 3)Use distributive property to check your answer! |

***Inequalities: Solve for the unknown and graph answer for #18-20.***

***Remember: If you divide or multiply by a NEGATIVE, you must flip your sign!!***

***Line under means closed circle, No line means open circle!***

|  |  |
| --- | --- |
| 1. 3x + 1 ≤ 10

 -1 -1 3x ≤ 9 ÷3 ÷3  **x ≤ 3** | Graph problem #18: Closed circle at 3 and graph to the lefthttp://www.mathematic.ws/wp-content/uploads/2009/04/number-line.png |
| 1. 4x + 7 ≤ 15

 **x ≤ 2** | Graph problem #19:Closed circle at 2 and graph to the lefthttp://www.mathematic.ws/wp-content/uploads/2009/04/number-line.png |
| 1. 6y + 7 < -11

 **y < -3** | Graph problem #20:Open circle at -3 graph to the righthttp://www.mathematic.ws/wp-content/uploads/2009/04/number-line.png |
| 1. What is the first step in solving for *x* in the equation below:

 7x – 5 = 37Add 5 to both sides of the equation to eliminate the constant  | 1. Asia’s age is 4 years less than three times his younger sister’s age. Write an equation that represents *a*, Asia’s age in terms of *s*, his sister’s age.

3s – 4 = a |
| 1. Which is one value of *x* that makes this inequality true?

 $\frac{-3}{4}$x > 61. **-9** c. 8
2. -8 d. 9
 | 1. Calvin had 93 video games to give away at an auction. At the end of the day, he had 9 games left. Which equation could be used to find g, the number of games he gave away?
2. g + 93 = 9 c. 9g = 93
3. 93 – g = 9 d. 9 ÷ g = 93
 |
| 1. Simplify the expression:

( 4$x^{3}$ + 2$x^{2}$ + 4x -7 ) – ( $x^{3}$ - 2$x^{2}$ – x – 2 ) Distribute the Negative.( 4$x^{3}$ + 2$x^{2}$ + 4x -7 ) + ( $-x^{3}$ + 2$x^{2}$ + x + 2 )Combine Like Terms: ( 4$x^{3}$ + 2$x^{2}$ + 4x -7 ) + ( $-x^{3}$ + 2$x^{2}$ + x + 2 )3$x^{3}$ + 4$x^{2}$ + 5x - 5 |  Identify the property:1. (-7 + 8) + 6 = -7 + (8 +6) Associative Property
2. 23 + 0 = 23 Identity Property

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