**Unit 2: Solving Equations and Inequalities**

**Lesson 4: Literal Equations & Coin Word Problems**

Objectives:

* I can solve literal equations
* I can solve algebraic word problems involving money

Agenda:

* Do Now: Reviewing polynomials
* Class Discovery: Literal Equations
* Solving Coin Problems
* Practice

Vocabulary: Coin problem, Literal Equation

**Homework: 2-4. Quiz at the End of the Week.**

**Web Help:**

<http://www.algebralab.org/Word/Word.aspx?file=Algebra_CoinProblems.xml>

https://www.cliffsnotes.com/study-guides/algebra/algebra-i/word-problems/coin-problems

**Name: \_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_**

**Quarter One Bonus Sheet. (2 points each)**

**You must show all work for complete credit.**

1. Find the difference of $\left(3x^{2}-2x+5\right) $and $(5x^{2}-3x+3)$. Then multiply the result by $\frac{1}{2}x^{2}$
2. Find the product of $(x^{2}+3) and \left(x^{3}-3x\right).$
3. Simplify $(-3x^{3}y^{5})^{2}$
4. Find the area of the triangle in terms of x with a base of $3x^{2} $and height of$(4x^{3}-2)$?

5. Solve for r in terms of A, P and t.

 $A=P+rt$

6. Solve for (v) in terms of K and m

 $K=\frac{1}{2}mv^{2}$

7. The cost of tickets for a play is $ 3.00 for adults and $ 2.00 for children. 350 tickets were sold and $ 950 was collected. How many tickets of each type were sold?

|  |  |  |
| --- | --- | --- |
| Types of coin | Quantity | Total |
| Adult tickets |  |  |
| Child tickets |  |  |
| Total |  |  |

Equation:

Solve:

8. Solve the following equation and describe the number property that is used in every step. (Associative, Multiplicative, Additive, Commutative, product of the means= the product of the extremes…)

 $\frac{9}{x-7}=\frac{6}{x}$

**Coin Word problems:** Lesson 4

We know that 1 quarter = $0.25, 1 dime = $0.10 cents, 1 nickel = $0.05, 1 penny =$0.01

1. Maddy has 11 more nickels than quarters in her purse. How many coins does she have if the total value of her coins is $2.65?

Set up a chart:

|  |  |  |
| --- | --- | --- |
| Types of coin | Quantity | Total value |
| Nickels (5) | x + 11 | 5(x + 11) |
| Quarters (25) | x | 25 x |
| Total |  |  |

Equation:

Solve:

1. Steven has twice as many nickels as pennies and 5 times as many dimes as pennies in his talking cow bank. He has total of $ 1.22. How many of each kind does he have?

|  |  |  |
| --- | --- | --- |
| Types of coin | Quantity | Total |
| Nickels (5) |  |  |
| Dimes (10) |  |  |
| Pennies (1) |  |  |
| Total |  |  |

Equation:

Solve:

Now: Suppose Steven has 24 coins in the cow bank. How many of each kind does he have?

**Now think about these**

1. Matt keeps quarters, nickels, and dimes in his change jar. He has a total of 52 coins. He has three more quarters than dimes and five fewer nickels than dimes. How many dimes does Matt have?

4. The cost of tickets for a play is $ 6.00 for adults and $ 4.00 for children. 350 tickets were sold and $ 950 was collected. How many tickets of each type were sold?

|  |  |  |
| --- | --- | --- |
| Types of coin | Quantity | Total |
| Adult tickets |  |  |
| Child tickets |  |  |
| Total |  |  |

Equation:

Solve:

1. Jenny has 21 coins. There were five less dimes than quarters and seven less nickels than quarters. How many of each kind of coin was there?
2. Kayla buys two items that cost d dollars each. She gives the cashier $20. Which expression represents the change she should receive?

A. 20 - 2d

B. 20 - d

C. 20 + 2d

D. 2d – 20

Mathematician: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Homework 2-4**

1. Ina has 3 times as many quarters as dimes in her wallet. All the coins total $ 1.70. How many coins of each type does she have?

|  |  |  |
| --- | --- | --- |
| **Types of coin** | **Quantity** | **Total** |
| Dimes |  |  |
| Quarters |  |  |
| Total |  |  |

**Equation:**

 **Solve:**

1. A collection of dimes and quarters is worth $3.30. There are three times as many dimes as quarters. How many of each coin are there?
2. Ben had three times as many nickels as dimes. If the total value of his coins was $1, how many of each kind of coin did he have?
3. (REGENTS) John has four more nickels than dimes in his pocket, for a total of $1.25. Which equation could be used to determine the number of dimes, x, in his pocket?
4. $0.10\left(x+4\right)+0.05\left(x\right)=\$1.25$
5. $0.05\left(x+4\right)+0.10\left(x\right)=\$1.25$
6. $0.10\left(4x\right)+0.05\left(x\right)=\$1.25$
7. $0.05\left(4x\right)+0.10\left(x\right)=\$1.25$
8. A piggy bank contained $14.55 in quarters, dimes and nickels. If there were three more than twice as many dimes as nickels and three less than three times as many quarters as nickels, how many of each kind of coin was in the piggy bank? No guessing. Only an algebraic solution will be accepted.

**Literal equations: Round 2.**

|  |  |
| --- | --- |
| 1. Solve for  ***p***:

$$\frac{1}{3}(p-4)=n$$ | 1. Solve for  ***r*** :

$V= π r^{2}h$ |
| 1. Solve for h:

 $V= π r^{2}h$ | 1. Solve for B:

$$V=\frac{1}{3}Bh$$ |

**Extra Practice:**

1. Maya bought a pencil and received change for $4 in 20 coins, all nickels and quarters. How many of each kind are given?

|  |  |  |
| --- | --- | --- |
| **Type of Coin** | **Quantity** | **Total** |
|  |  |  |
|  |  |  |
| **Total** |  |  |

**Equation:**

**Solve:**