Warm up ->

- **Mon**: Word Problem Practice
- **Tues**: Equivalent Equations Practice
- **Wed**: Workbook pg 137
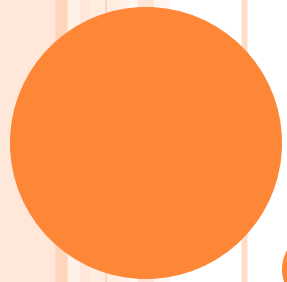- **Thurs**: Study for the BIG BIG BIG equations quiz
- **Fri: (Big Big Equations Qz)**

5-2 Writing and solving two step equations

Essential Question:
How do you write and solve verbal sentences, and word problems, as two-step equations?

REVIEW

In Chapter 1, you learned how to write verbal phrases as expressions.

Phrase: the sum of 4 times some number and 99

Expression: 4n   +   99

An equation is a statement that two expressions are equal. The expressions are joined with an equals sign. Look for the words equals or is equal to when you translate sentences into equations

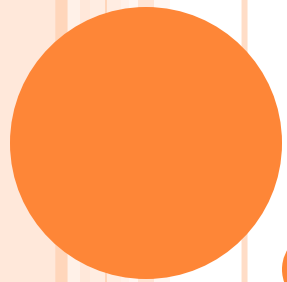Sentence: The sum of 4 times some number and 99 is 299

Equation: 4n + 99   = 299

Solving two step equations

- $3x + 9 = 12$
- $4m - 8 = -128$

Tying it all together

Translate sentences into equations:

Six more than twice a number is -20 $\qquad$ $2n + 6 = -20$

Eighteen is 6 less than four times a number $\qquad$ $18 = 4n - 6$

The quotient of a number and 5, increased by 8, is equal to 14 $\qquad$ $\dfrac{n}{5} + 8 = 14$

Remember: Read carefully what the problem is saying. Don't mix up quotient ($\div$) and product ($\times$).

Translate and Solve an Equation

Seven more than three times a number is 31. Find the number.

Words: Seven more than three times a number is 31

Variables: Let n = the number

Equation: 3n + 7 = 31

$$3n + 7 = 31$$
$$3n + 7 - 7 = 31 - 7$$
$$\frac{3n}{3} = \frac{24}{3}$$
$$n = 8$$

Check:
$$3(8) + 7 = 31$$
$$24 + 7 = 31$$
$$31 = 31$$

Write and solve a two-step equation

Suppose you are saving money to buy a scooter that costs $100. You have already saved $60 and plan to save $5 each week. How many weeks will you need to save?

Explore: You have already saved $60 and you plan to save $5 a week until you have $100.

Plan: Organize the data for the first few weeks in a table. Notice the pattern.

Write an equation To represent the Situation. Let x Equal the number of weeks.

Week	Amount
0	5(0)+60=60
1	5(1)+60=65
2	5(2)+60=70
3	5(3)+60=75

$5x + 60 = 100$

Now solve

$5x + 60 = 100$

$5x + 60 - 60 = 100 - 60$

$$\frac{5x}{5} = \frac{40}{5}$$

$x = 8$

Check:

$5(8) + 60 = 100$

$40 + 60 = 100$

$100 = 100$

You need to save $5 each week for 8 weeks.

In the 2000 Summer Olympics, the United States won 9 more medals than Russia. Together they won 185 medals. How many more medals did the United States win?

Words: Together they won 185 medals

Variables: Let x = number of medals Russia won
Then $x + 9$ = number of medals won by U.S.

Equation: $x + (x+9) = 185$

Solve:

$$x + (x + 9) = 185$$
$$2x + 9 = 185$$
$$2x + 9 - 9 = 185 - 9$$
$$\frac{2x}{2} = \frac{176}{2}$$
$$x = 88$$

Check:
$$88 + (88+9) = 185$$
$$88 + 97 = 185$$
$$185 = 185$$

Russia won 88 medals
U.S. won 97 medals

Check It Out: Example 3

Jack's father rented a car while they were on vacation. He paid a rental fee of $20.00 per day. He paid $25.00 for mileage and his total bill for renting the car was $165.00. For how many days did he rent the car?

Let d represent the number of days he rented the car.

$20d + 25 = 165$

$\underline{\hspace{2em} -\ 25 \quad -\ 25}$ *Subtract 25 from both sides.*

$20d \qquad\quad = 140$

$\dfrac{20d}{20} = \dfrac{140}{20}$ *Divide both sides by 20.*

$d = 7$

Jack's father rented the car for 7 days.

Last Sunday, the Humane Society had a 3-hour adoption clinic. During the week the clinic is open for
2 hours on days when volunteers are available.

If the Humane Society was open for a total of 9 hours last week, how many weekdays was the clinic open?

$$2d + 3 = 9$$

A taxi charges an airport pickup fee of $3 plus $1.50 for each mile traveled. If a taxi ride cost John $36, how many miles did John travel in the taxi?

$$1.5m + 3 = 36$$

Additional Example 3: *Consumer Math Application*

Jamie rented a canoe while she was on vacation. She paid a flat rental fee of $85.00, plus $7.50 each day. Her total cost was $130.00. For how many days did she rent the canoe?

Let d represent the number of days she rented the canoe.

$$7.5d + 85 = 130$$

$$\underline{\quad\quad -85 \quad\quad -85} \quad \text{\textit{Subtract 85 from both sides.}}$$

$$7.5d \quad\quad = \quad 45$$

$$\frac{7.5d}{7.5} = \frac{45}{7.5} \quad \text{\textit{Divide both sides by 7.5.}}$$

$$d \; = 6$$

Jamie rented the canoe for 6 days.

Last week, Carlie had several rice cakes and 3 granola bars as snacks. The snacks contained a total of 800 calories. If each granola bar had 120 calories and each rice cake had 40 calories, how many rice cakes did she have?

Erika is following a 2,200 calorie per-day diet. She eats the recommended 9 servings of breads and cereals, averaging 120 calories per serving. She also eats 5 servings of vegetables. If the rest of her daily intake is 870 calories, what is the average number of calories in each serving of vegetables?

Brandon follows a 2,800 calorie per-day diet. He has 11 servings of breads and cereals, which average 140 calories each. Yesterday, he had a combined 9 servings of fruits and vegetables, averaging 60 calories each. How many 180-calorie servings of meat and milk did he have to complete his diet?

HOMEWORK

Kuta Software worksheet: Choose 10