

# 6<sup>th</sup> Grade Math Unit 4-Equations

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

Period: \_\_\_\_\_

## Calendar:

|   |   |   |
|---|---|---|
| <b>Thursday, November 1<sup>st</sup></b> <ul style="list-style-type: none"> <li>Focus: Equations (adding and subtracting)</li> <li>IXL Topic: Z.1, Z.2, Z.6</li> </ul>                  | <b>Friday, November 2<sup>nd</sup></b> <ul style="list-style-type: none"> <li>Focus: Equations (adding and subtracting)</li> <li>IXL Topic: Z.1, Z.2, Z.6</li> </ul>                                | <b>Monday, November 5<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Equations (multiplying and dividing)</li> <li>IXL Topic: Z.1, Z.2, Z.6</li> </ul>    |
| <b>Tuesday, November 6<sup>th</sup></b><br><br><b>Teacher Work Day- Election Day! (Equations Practice)</b>  | <b>Wednesday, November 7<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Equations Practice</li> <li>IXL Topic: Z.1, Z.2, Z.6</li> </ul>   | <b>Thursday, November 8<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Functions (Input/ Output Tables)</li> <li>IXL Topic: BB.5, BB.8, BB.10</li> </ul>  |
| <b>Friday, November 9<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Functions (writing rule from table and graphing)</li> <li>IXL Topics: BB.5, BB.8, BB.10</li> </ul> | <b>Monday, November 12<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Inequalities (review and writing inequalities for scenarios)</li> <li>IXL Topics: AA.1, AA.2, AA.4</li> </ul> | <b>Tuesday, November 13<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: One Step Inequalities and Graphing</li> <li>IXL Topic: AA.1, AA.2, AA.4</li> </ul> |
| <b>Wednesday, November 14<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: One Step Inequalities and Graphing</li> <li>IXL Topic: AA.1, AA.2, AA.4</li> </ul>             | <b>Thursday, November 15<sup>th</sup></b><br><br><b>Review Day ☺</b><br><br><b>(Ms. Rankin at Meeting)</b>  | <b>Monday, November 26<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Inequalities wrap up</li> <li>IXL Topic: AA.1, AA.2, AA.4</li> </ul>                |
| <b>Tuesday, November 27<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Study Guide</li> <li>IXL Topic: AA.1, AA.2, AA.4</li> </ul>                                      | <b>Wednesday, November 28<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Review</li> <li>IXL Topic: AA.1, AA.2, AA.4</li> </ul>   | <b>Thursday, November 29<sup>th</sup></b> <ul style="list-style-type: none"> <li>Focus: Unit Test</li> <li>IXL Topic: AA.1, AA.2, AA.4</li> </ul>                         |

**\*If Lost, Please Return to: Ms. Rankin (Room-F106)**

## Standards:

**MGSE6.EE.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

**MGSE6.EE.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

**MGSE.6.EE.7** Solve real-world and mathematical problems by writing and solving equations of the form  $x + p = q$  and  $px = q$  for cases in which  $p$ ,  $q$  and  $x$  are all nonnegative rational numbers.

**MGSE.6.EE.8** Write an inequality of the form  $x < c$  or  $x > c$  to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form  $x < c$  or  $x > c$  have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

**MGSE6.EE.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another. a. Write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. b. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation  $d = 65t$  to represent the relationship between distance and time.

## Essential Questions:

- How is an equation like a balance? How can the idea of balance help me solve an equation?
- What strategies can I use to help me understand and represent real situations using proportions, equations and inequalities?
- How can I write, interpret and manipulate proportions, equations, and inequalities?
- How can I solve a proportion and an equation?
- How can I tell the difference between an expression, equation and an inequality?
- How are the solutions of equations and inequalities different?
- What does an equal sign mean mathematically?
- How can proportions be used to solve problems?
- How can proportional relationships be described using the equation  $y = kx$ ?
- How can proportional relationships be represented using rules, tables, and graphs?
- How can the graph of  $y = kx$  be interpreted for different contexts?
- How does a change in one variable affect the other variable in a given situation?
- Which tells me more about the relationship I am investigating, a table, a graph or a formula?

# Vocabulary Words:

**Addition Property of Equality:** Adding the same number to each side of an equation produces an equivalent expression.

- **Constant of proportionality:** The constant value of the ratio of two proportional quantities  $x$  and  $y$ ; usually written  $y = kx$ , where  $k$  is the constant of proportionality. In a proportional relationship,  $y = kx$ ,  $k$  is the constant of proportionality, which is the value of the ratio between  $y$  and  $x$ .
- **Dependent variable-** A variable that depends on other factors. For example, a test score could be a dependent variable because it could change depending on several factors such as how much you studied, how much sleep you got the night before you took the test, or even how hungry you were when you took it.
- **Direct Proportion (Direct Variation):** The relation between two quantities whose ratio remains constant. When one variable increases the other increases proportionally: When one variable doubles the other doubles, when one variable triples the other triples, and so on. When  $A$  changes by some factor, then  $B$  changes by the same factor:  $A = kB$ , where  $k$  is the constant of proportionality.
- **Division Property of Equality:** States that when both sides of an equation are divided by the same number, the remaining expressions are still equal
- **Equation:** A mathematical sentence that contains an equal sign
- **Independent variable:** A variable that stands alone and isn't changed by the other variables you are trying to measure. For example, someone's age might be an independent variable.

**Inequality:** A mathematical sentence that contains the symbols  $>$ ,  $<$ ,  $\geq$ , or  $\leq$ .

- **Inverse Operation:** A mathematical process that combines two or more numbers such that its product or sum equals the identity.
- **Multiplication Property of Equality:** States that when both sides of an equation are multiplied by the same number, the remaining expressions are still equal.
- **Proportion:** An equation which states that two ratios are equal.
- **Solution:** the set of all values which, when substituted for unknowns, make an equation true.
- **Substitution:** the process of replacing a variable in an expression with its actual value.
- **Subtraction Property of Equality:** States that when both sides of an equation have the same number subtracted from them, the remaining expressions are still equal.
- **Term:** A number, a variable, or a product of numbers and variables.
- **Variable:** A letter or symbol used to represent a number or quantities that vary.

## Solving One-Step EQUATIONS – Addition/Subtraction

- An equation is a math sentence that **DOES** contain an \_\_\_\_\_.
- The goal of solving an equation is to **find the value of the variable**.
  - We do this by **isolating** the variable on one side of the equation using **Inverse Operations!**
    - **Inverse operations** “undo” each other!

Inverse of addition? \_\_\_\_\_

Inverse of subtraction? \_\_\_\_\_

Inverse of multiplication? \_\_\_\_\_

Inverse of division? \_\_\_\_\_

### Examples:

John has  $x$  apples. If he adds 5 apples to his pile, he will have 8 apples.  
What is the value of  $x$ ?

Maddie has  $x$  dollars. After spending \$90 on a purse, she will have \$45. What is the value of  $x$ ?

Write an equation:  $x + 5 = 8$   
 $-5 = -5$   


---

 $x = 3$

Write an equation:  $x - 90 = 45$   
 $+90 = +90$   


---

 $x = 135$

Answer: John had 3 apples before he added to his pile.

Answer: Maddie had \$135 before she bought the purse.

Check:  $3 + 5 = 8$

Check:  $135 - 90 = 45$

### Let's Practice!

1.  $x + 2 = 10$

$$\begin{array}{r} \square + 2 = 10 \\ \hline \square + 0 = \square \end{array}$$

$$x + 0 = \square$$

2.  $y - 8 = 15$

$$\begin{array}{r} \square - 8 = 15 \\ \hline \square - 0 = \square \end{array}$$

$$y - 0 = \square$$

3.  $a + 9 = 2$

$$\begin{array}{r} \square + 9 = 2 \\ \hline \square + 0 = \square \end{array}$$

$$a + 0 = \square$$

Check:

Check:

Check:

Solve

1)  $x + 7 = 18$

2)  $a - 15 = 22$

3)  $83 = y - 17$

4)  $c - 3 = 6$

5)  $x + 8 = 18$

6)  $y - 5 = 4$

7)  $6 + z = 10$

8)  $p - 5 = 15$

9)  $4 + m = 12$

10)  $g + 44 = 50$

11)  $x - 9 = 2$

12)  $a + 10 = 17$

13)  $y - 4 = 19$

14)  $b - 17 = 12$

15)  $3 = d + 2$

16)  $i + 13 = 27$

17)  $y - 4 = 6$

18)  $x + 5 = 8$

19)  $x - 4 = 9$

20)  $24 = n + 13$

21)  $d - 9 = 11$

## Solving One-Step Equations: Addition and Subtraction

You must show your work to get credit! Check your answer.

1)  $y + 6 = 20$

2)  $x - 10 = 12$

3)  $12 + z = 15$

4)  $2 + n = 16$

5)  $a + 4 = 14$

6)  $m - 5 = 10$

7)  $4 + b = 30$

8)  $10 + c = 25$

9)  $x - 60 = 20$

10)  $g - 16 = 4$

11)  $x - 15 = 20$

12)  $w + 14 = 18$

13)  $r - 18 = 27$

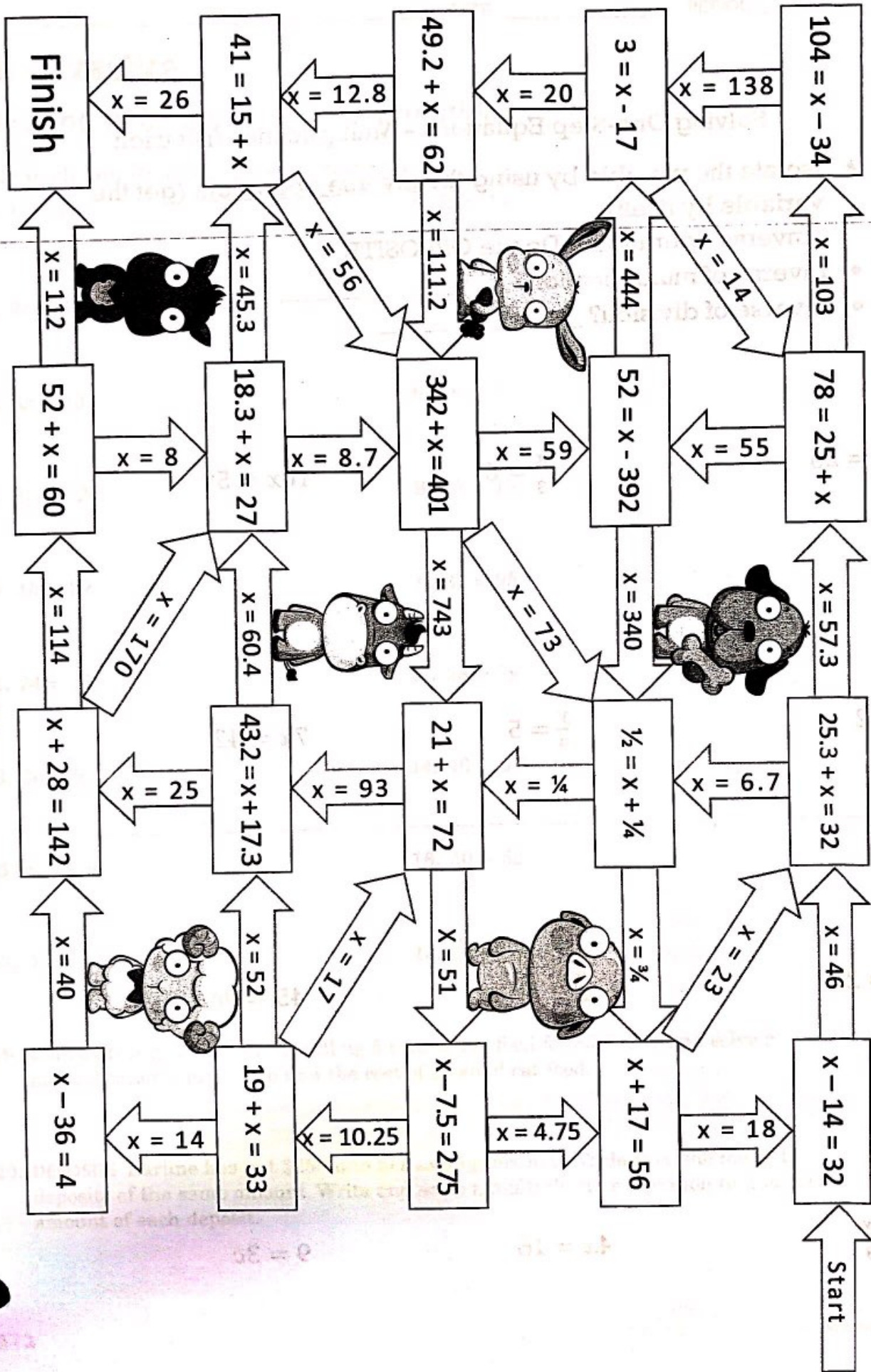
14)  $13 + k = 25$

15)  $f - 16 = 34$

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

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

Core: \_\_\_\_\_



## Solving One-Step Equations – Multiplication/Division

- Isolate the variable by using the inverse operation. (get the variable by itself)
- \*Inverse operation = Do the OPPOSITE
- Inverse of multiplication? \_\_\_\_\_
- Inverse of division? \_\_\_\_\_

$$5x = 25$$

$$\frac{x}{3} = 6$$

$$10x = 50$$

$$\frac{e}{4} = 2$$

$$\frac{y}{9} = 5$$

$$7x = 42$$

$$2k = 22$$

$$\frac{w}{7} = 63$$

$$45 = 9c$$

$$7 = \frac{w}{3}$$

$$4x = 16$$

$$9 = 3c$$



**Skills Practice****Solve and Write Multiplication Equations**

Solve each equation. Check your solution.

1.  $3a = 9$

2.  $7b = 14$

3.  $9c = 36$

4.  $8c = 16$

5.  $3x = 18$

6.  $7n = 7$

7.  $10g = 20$

8.  $3k = 15$

9.  $4h = 32$

10.  $27 = 9h$

11.  $24 = 12j$

12.  $28 = 7y$

13.  $36 = 9y$

14.  $40 = 0.5r$

15.  $5 = \frac{1}{5}w$

16.  $50 = 5p$

17.  $0.25f = 10$

18.  $\frac{3}{4} = \frac{1}{4}w$

19. **CAT FOOD** A grocery store is selling 6 cans of cat food for \$3. Write and solve a multiplication equation to find the cost of a can of cat food.

20. **DEPOSITS** Earline has put \$250 into her savings account. To do this, she made 10 deposits of the same amount. Write and solve a multiplication equation to find the amount of each deposit.

# Skills Practice

## Solve and Write Division Equations

Solve each equation. Check your solution.

1.  $4 = \frac{r}{2}$

2.  $6 = \frac{j}{2}$

3.  $7 = \frac{k}{2}$

4.  $\frac{p}{4} = 9$

5.  $\frac{h}{4} = 8$

6.  $\frac{s}{5} = 6$

7.  $10 = \frac{r}{5}$

8.  $11 = \frac{a}{3}$

9.  $12 = \frac{q}{4}$

10.  $\frac{p}{5} = 9$

11.  $\frac{y}{7} = 10$

12.  $\frac{b}{12} = 10$

13.  $12 = \frac{r}{5}$

14.  $11 = \frac{d}{11}$

15.  $9 = \frac{r}{13}$

16.  $\frac{b}{15} = 2.5$

17.  $2.2 = \frac{c}{14}$

18.  $0.5 = \frac{d}{10}$

Write and solve a division equation.

19. **LAWN MOWING** Ali was paid \$75 for mowing a neighbor's yard. This is one fourth of the amount of money she earned all summer. How much did Ali earn all summer?

20. **POOL** The width of a swimming pool is one third of its length. The width of the pool is 15 feet. What is the length of the pool?

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# Color By Number: One Step Equations with Multiplication & Division

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

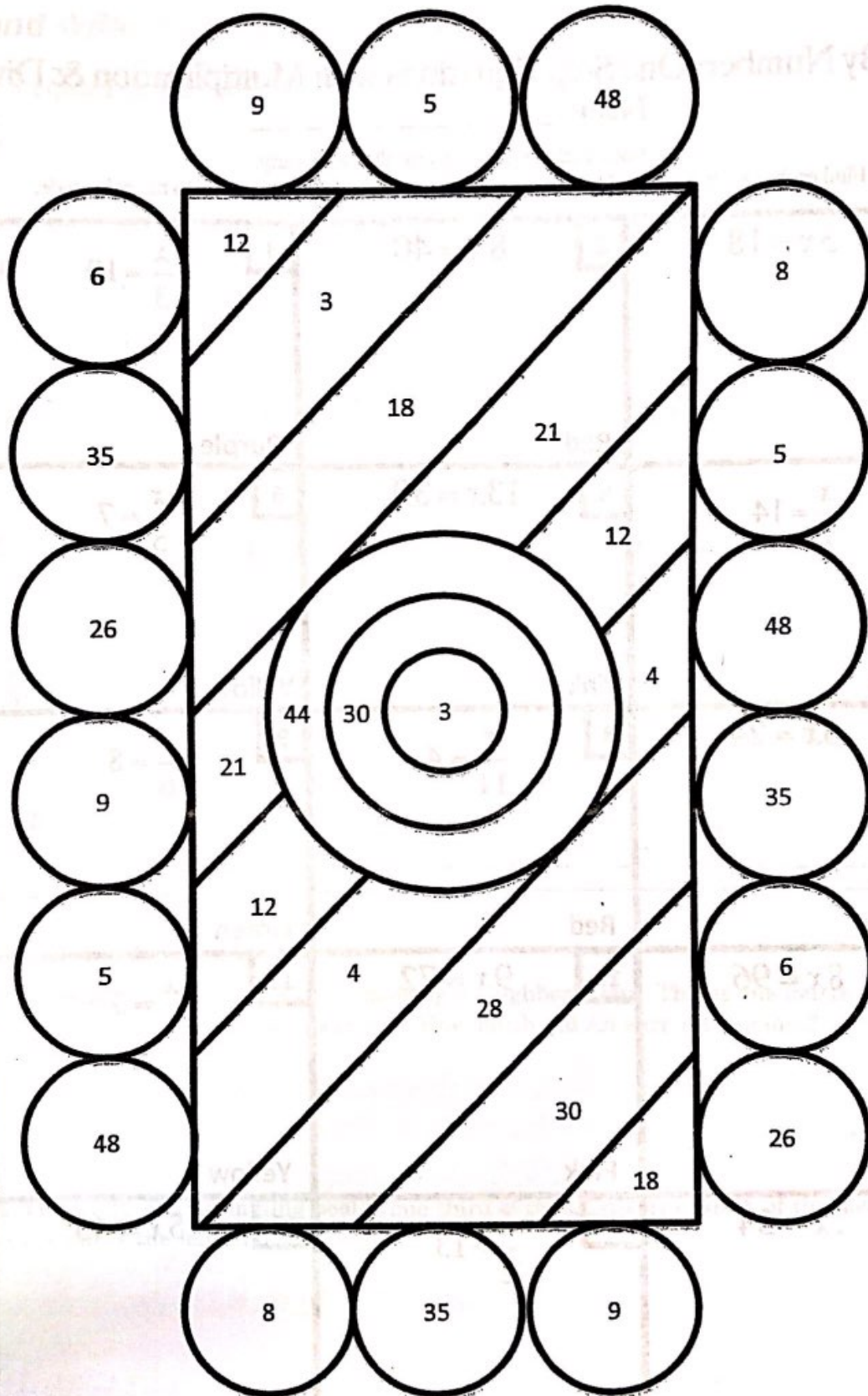
Solve each problem. Show all work clearly.

Find each answer on the coloring page and color symmetrically according to the color code.

|                                  |                                    |                                   |
|----------------------------------|------------------------------------|-----------------------------------|
| 1<br>$3x = 18$<br>Blue           | 2<br>$8x = 40$<br>Red              | 3<br>$\frac{x}{3} = 10$<br>Purple |
| 4<br>$\frac{x}{2} = 14$<br>Green | 5<br>$13x = 39$<br>Pink            | 6<br>$\frac{x}{5} = 7$<br>Yellow  |
| 7<br>$6x = 24$<br>Orange         | 8<br>$\frac{x}{11} = 4$<br>Red     | 9<br>$\frac{x}{6} = 8$<br>Green   |
| 10<br>$8x = 96$<br>Blue          | 11<br>$9x = 72$<br>Pink            | 12<br>$\frac{x}{7} = 3$<br>Yellow |
| 13<br>$3x = 54$<br>Red           | 14<br>$\frac{x}{2} = 13$<br>Orange | 15<br>$5x = 45$<br>Purple         |

Objective: Students will solve one step equations.

Activities by Jill



Objective: Students will solve one step equations.  
 Activities by Jill

## Error Analysis – ONE-STEP EQUATIONS

Read the word problem. Look at the students work and solution. Identify the error and describe it. Solve the problem correctly. Then share a strategy this student could use to prevent the same error in the future.

**The equation  $8h = 200$  can be used to find how many hours  $h$  a person needs to work to earn \$200 at \$8 per hour. How many hours does a person need to work to earn \$200?**

| Incorrect Work/Solution   | Identify and Explain the Error           |
|---|--|
| $\frac{8h}{200} = \frac{200}{200}$ $h = 0.04$ <p>A person needs to work 0.04 hours.</p> | <br><br><br><br><br><br><br><br><br><br> |
|   |  |
|   |  |

$$\frac{8h}{200} = \frac{200}{200}$$

$$h = 0.04$$

A person needs to work 0.04 hours.

**Correct Work/ Solution**

**Share a Strategy**

# Error Analysis – ONE-STEP EQUATIONS

Read the word problem. Look at the students work and solution. Identify the error and describe it. Solve the problem correctly. Then share a strategy this student could use to prevent the same error in the future.

**Henry and Rick have 265.3 downloaded minutes of music. If Henry has 112 minutes, how many belong to Rick? Write and solve an addition equation to find how many minutes belong to Rick?**

| Incorrect Work/Solution   | Identify and Explain the Error           |
|---|--|
| <p><math>r =</math> the number of minutes that belong to Rick.</p> $112 + r = 265.3$ $\begin{array}{r} -112 \\ \hline r = 377.3 \end{array}$ <p>Rick has 377.3 minutes.</p> | <br><br><br><br><br><br><br><br><br><br> |
| Correct Work/ Solution  | Share a Strategy                         |
| <br><br><br><br><br><br><br><br><br><br>  | <br><br><br><br><br><br><br><br><br><br> |

# Error Analysis – ONE-STEP EQUATIONS

Read the word problem. Look at the students work and solution. Identify the error and describe it. Solve the problem correctly. Then share a strategy this student could use to prevent the same error in the future.

**Charlotte's ice skates cost \$30.45 less than her skateboard. Her ice skates cost \$95.28. How much did her skateboard cost? Write and solve a subtraction equation.**

### Incorrect Work/Solution

$b =$  the cost of the skateboard

$$\begin{aligned} b - 30.45 &= 95.28 \\ - 30.45 &- 30.45 \\ \hline b &= 64.83 \end{aligned}$$

The skateboard cost \$64.83.

### Correct Work/ Solution

### Identify and Explain the Error

### Share a Strategy

## Error Analysis – ONE-STEP EQUATIONS

Read the word problem. Look at the students work and solution. Identify the error and describe it. Solve the problem correctly. Then share a strategy this student could use to prevent the same error in the future.

**Karen is buying ribbon to make hair bows. She wants to divide the ribbon into 6.2 inch pieces for 15 bows. Write and solve a division equation to find the length of ribbon Karen should buy.**

### Incorrect Work/Solution

$r$  = the length of ribbon Karen should buy.

$$\frac{r}{6.2} = 15$$

$$6.2$$

$$\frac{r}{6.2} (\div 6.2) = 15 (\div 6.2)$$

$$6.2$$

$$r \approx 2.4$$

Karen should buy about 2.4 inches of ribbon.

### Correct Work/ Solution

### Share a Strategy

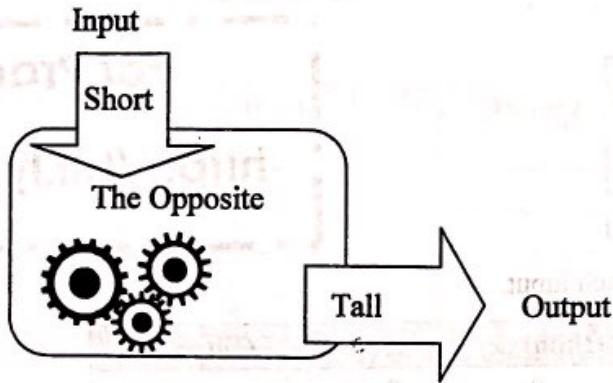


Name: \_\_\_\_\_ Date: \_\_\_\_\_

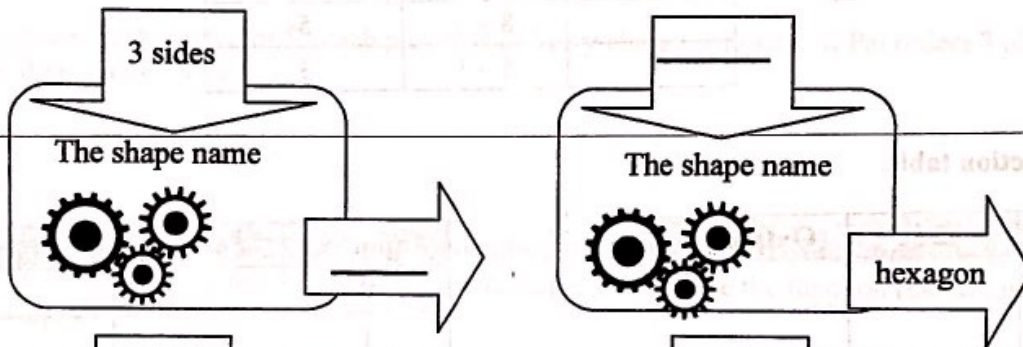
### Machines at Work

Use the example below to complete the following machines.

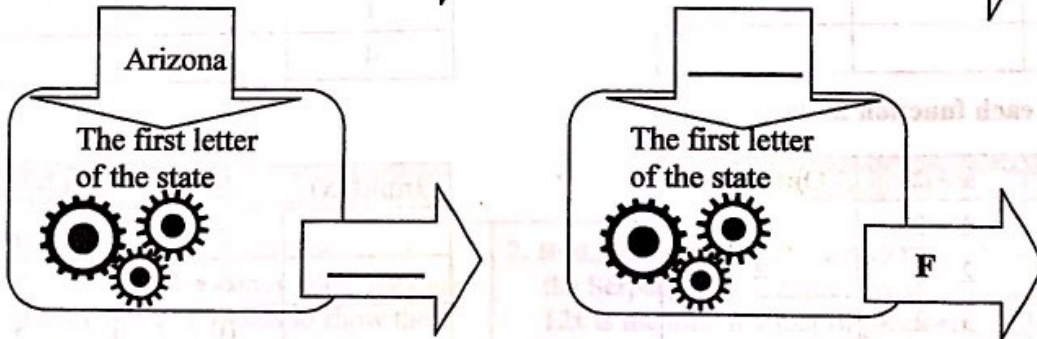
EXAMPLE:



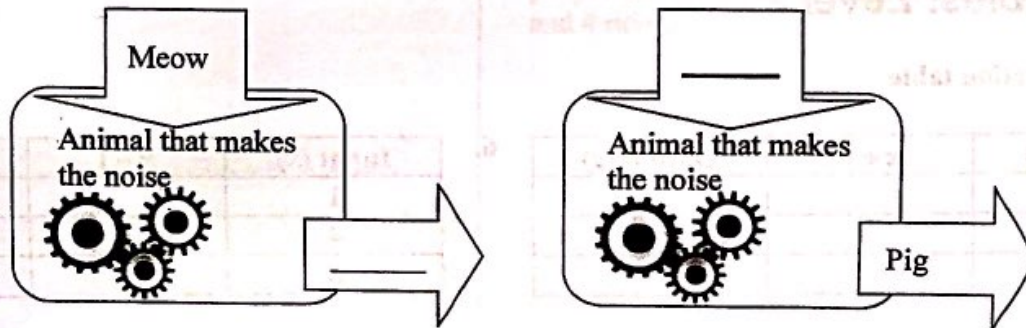
1.



2.



3.



## Function Tables: Level 1

A function rule describes the relationship between the input and output of a function. The inputs and outputs can be organized in a function table.

### Example

Complete the function table.

| Input (x) | $x-3$ | Output (y) |
|-----------|-------|------------|
| 9         | $9-3$ |            |
| 8         | $8-3$ |            |
| 6         | $6-3$ |            |

For Practice:  
<http://bit.ly/OaDSkA>

The function rule is  $x - 3$ . Subtract 3 from each input.

| Input | Output             |
|-------|--------------------|
| 9     | $-3 \rightarrow 6$ |
| 8     | $-3 \rightarrow 5$ |
| 6     | $-3 \rightarrow 3$ |

| Input (x) | $x-3$ | Output (y) |
|-----------|-------|------------|
| 9         | $9-3$ | 6          |
| 8         | $8-3$ | 5          |
| 6         | $6-3$ | 3          |

### Exercises

Complete each function table.

1.

| Input (x) | $2x$ | Output (y) |
|-----------|------|------------|
| 0         |      |            |
| 2         |      |            |
| 4         |      |            |

2.

| Input (x) | $4+x$ | Output (y) |
|-----------|-------|------------|
| 0         |       |            |
| 1         |       |            |
| 4         |       |            |

Find the input for each function table.

3.

| Input (x) | $x+2$ | Output (y) |
|-----------|-------|------------|
|           | $1+2$ | 3          |
|           | $2+2$ | 4          |
|           | $5+2$ | 7          |

4.

| Input (x) | $x+2$       | Output (y) |
|-----------|-------------|------------|
|           | $2 \div 2$  | 1          |
|           | $6 \div 2$  | 3          |
|           | $10 \div 2$ | 5          |

## Function Tables: Level 2

Complete each function table.

5.

| Input (x) | $x+6$ | Output (y) |
|-----------|-------|------------|
| 0         |       |            |
| 3         |       |            |
| 7         |       |            |

6.

| Input (x) | $x-1$ | Output (y) |
|-----------|-------|------------|
| 1         |       |            |
| 4         |       |            |
| 8         |       |            |

7.

| Input (x) | $3x+2$ | Output (y) |
|-----------|--------|------------|
| 0         |        |            |
| 2         |        |            |
| 4         |        |            |

8.

| Input (x) | $x \div 2$ | Output (y) |
|-----------|------------|------------|
| 4         |            |            |
| 8         |            |            |
| 10        |            |            |

Find the input for each function table.

| Input (x) | $x + 4$ | Output (y) |
|-----------|---------|------------|
|           |         | 1          |
|           |         | 2          |
|           |         | 4          |

10.

| Input (x) | $x + 2$ | Output (y) |
|-----------|---------|------------|
|           |         | 1          |
|           |         | 3          |
|           |         | 5          |

11.

| Input (x) | $x - 3$ | Output (y) |
|-----------|---------|------------|
|           |         | 0          |
|           |         | 2          |
|           |         | 3          |
|           |         | 5          |
|           |         | 8          |

12.

| Input (x) | $3x + 3$ | Output (y) |
|-----------|----------|------------|
|           |          | 3          |
|           |          | 6          |
|           |          | 9          |
|           |          | 12         |
|           |          | 15         |

13. **FOOD** A pizza place sells pizzas for \$7 each plus a \$4 delivery charge per order. If Pat orders 3 pizzas to be delivered, what will be his total cost?

14. **MOVIES** A store sells used DVDs for \$8 each and used videotapes for \$6 each. The function rule  $8d + 6v$  can be used to represent the total selling price of DVDs  $d$  and videotapes  $v$ . Then use the function rule to find the price of 5 DVDs and 3 videotapes.

### Function Tables: Level 3

1. **DRAGONS** The Luck Dragons that live in the Enchanted Forest weigh  $4x$  pounds when they are  $x$  years old. Make a table of values to show the weights of 6-year-old, 8-year-old, and 10-year-old Luck Dragons.

| Age (x) | Weight (y) |
|---------|------------|
| 6       | 24         |
| 8       | 32         |
| 10      | 40         |

2. **ROLLER COASTER** Twelve people are able to ride the Serpent of Fire roller coaster at one time. The rule  $12x$  is the total number of people that ride after  $x$  rides. Make a table of values to show the total number of people that have been on the roller coaster after 1, 2, 3, and 4 rides.

| Rides (x) | Total People (y) |
|-----------|------------------|
| 1         | 12               |
| 2         | 24               |
| 3         | 36               |
| 4         | 48               |

NAME

DATE

PERIOD

2. **MOVIES** At a local movie theater, it costs each student \$5 to see a movie. The rule  $5x$  represents the total amount of money the theater collects from  $x$  students. Make a table of values to show the total amount of money the theater collects from 2, 5, and 6 students.

| Number of students ( $x$ ) | Total amount of money collected ( $5x$ ) |
|----------------------------|--|
| 2                          |  |
| 5                          |  |
| 6                          |  |

4. **RABBITS** The Friendly Critters Pet Store keeps 3 rabbits in each cage. The rule  $3x$  represents the number of rabbits that  $x$  cages can hold. Make a table of values to show how many cages it takes to hold 9, 15, and 18 rabbits.

| Number of rabbits | Number of cages ( $x$ ) |
|-------------------|-------------------------|
| 9                 |                         |
| 15                |                         |
| 18                |                         |

5. **BEADS** A bead shop sells glass beads for \$7 each minus a \$2 discount. The rule  $7x - 2$ , where  $x$  is the number of glass beads, can be used to find the total cost of  $x$  beads. Make a table of values to show how much it costs to buy 5, 6, and 9 glass beads.

| Number of glass beads ( $x$ ) | Total cost ( $7x - 2$ ) |
|-------------------------------|-------------------------|
| 5                             |                         |
| 6                             |                         |
| 9                             |                         |

6. Use the rule given in Exercise 5 to find the selling price of 15 glass beads.

| Number of glass beads ( $x$ ) | Total cost ( $7x - 2$ ) |
|-------------------------------|-------------------------|
| 15                            |                         |

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

Amy loves going to see new movies at the movie theater. She is considering 3 different movie plans this year. The breakdown of what each movie plan offers is detailed in the table below.



| Plan              | Membership Price                   |
|-------------------|------------------------------------|
| Regal Movies Plus | \$10 per movie                     |
| AMC Cinema Pass   | \$15 per year plus \$5 per movie   |
| Movie Pass        | \$90 per year for unlimited movies |

Depending on her schedule, Amy is able to attend 15 or 25 movies each year. She needs to figure out how much she will pay per year for each plan if she sees 15 or 25 movies each year.

**Part A:** Write an equation for the Regal Movies Plus and AMC Cinemas Pass plans, showing how much Amy will pay each year.

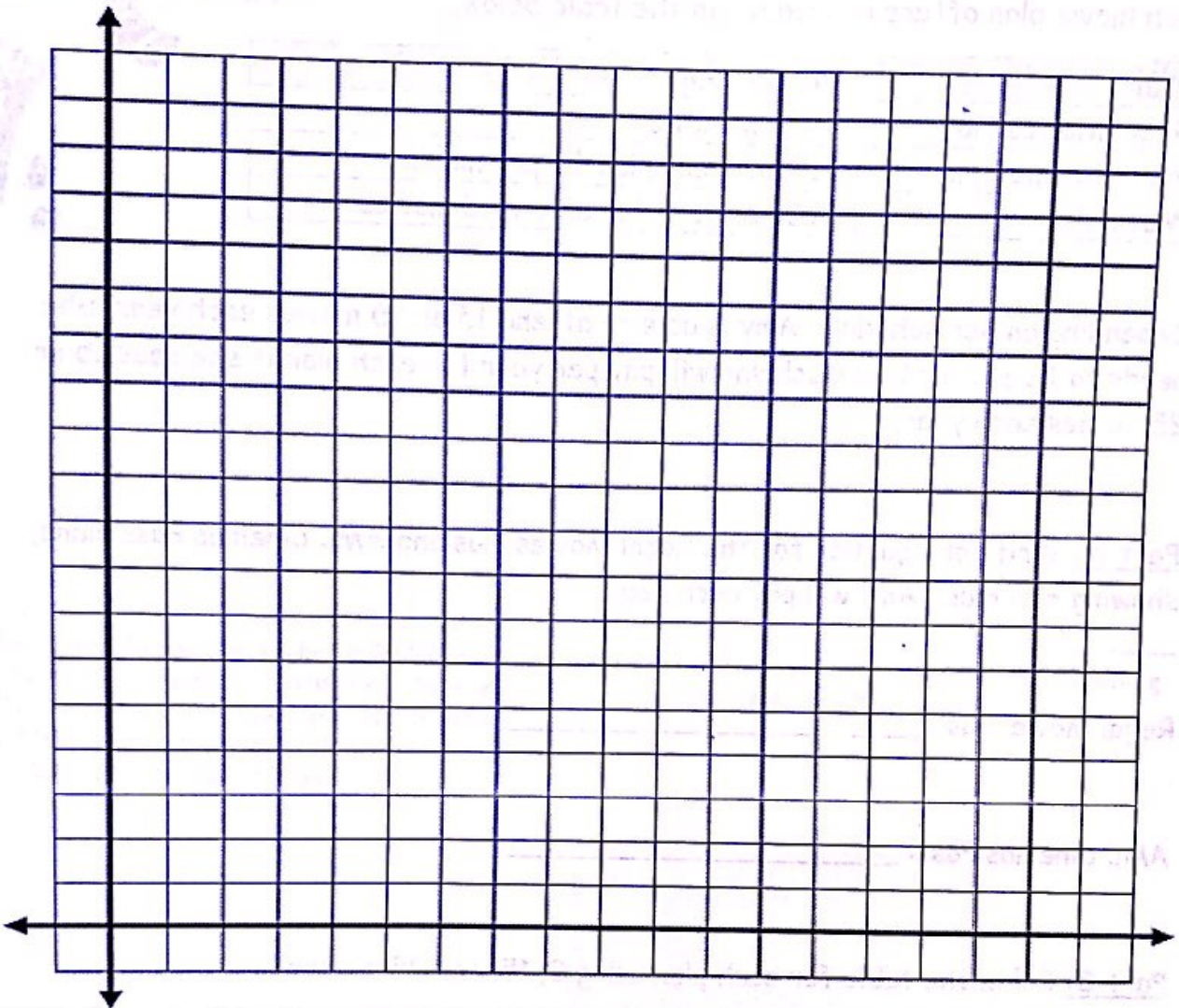
Regal Movie Plus: \_\_\_\_\_

AMC Cinemas Pass: \_\_\_\_\_

**Part B:** Fill in the table for each plan using 0, 15, and 25 movies.

| Regal: _____ |      | AMC: _____ |      | Movie Pass: _____ |      |
|--------------|------|------------|------|-------------------|------|
| Movies       | Cost | Movies     | Cost | Movies            | Cost |
| 0            |      | 0          |      | 0                 |      |
| 15           |      | 15         |      | 15                |      |
| 25           |      | 25         |      | 25                |      |

**Part C:** Construct a graph for each movie plan on the same coordinate plane. Label each line with the corresponding name of the plan.



| Movie Plan | Cost | Movies |
|------------|------|--------|
| Plan A     | 10   | 10     |
| Plan B     | 15   | 15     |
| Plan C     | 20   | 20     |





**Part D:** Choose the correct option in each set to correctly complete the statement.

If Amy goes to the movies 15 times in a year, the least expensive is the \_\_\_\_\_ plan. If she goes to the movies 25 times in a year, the least expensive is \_\_\_\_\_ plan.

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

\_\_\_\_\_ : a mathematical sentence indicating that two quantities are not equal.

Symbols: \_\_\_\_\_

| <  | ≤   | >  | ≥   |
|--|---|--|---|
| Less than<br>Is smaller than<br>Is less than<br>Below                            | Less than or equal to<br>Maximum<br>At most<br>Not more than<br>Is not greater than | Greater than<br>Is more than<br>Is greater than<br>Is larger than<br>Above         | Greater than or equal to<br>Minimum<br>At least<br>Is not less than<br>Not smaller than |
|  |    |  |      |

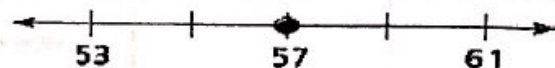
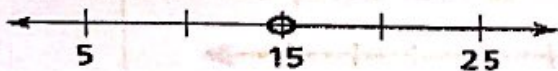
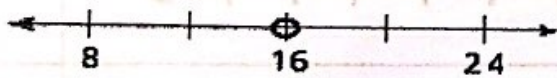
Which of the following numbers is a solution (answer)?

1.  $f + 2 < 9$  Is 8 a solution?

3.  $12 \leq 18 - y$  Is 6 a solution?

2.  $n - 3 > 6$  Is 9 a solution?

4.  $17 \geq 11 + x$  Is 8 a solution?



## Graphing Inequalities Notes:

There are 3 important pieces to graphing an inequality:


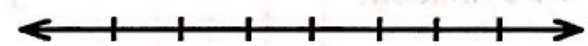
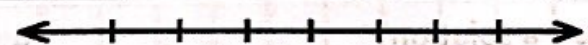
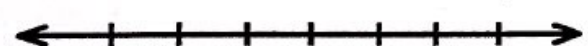
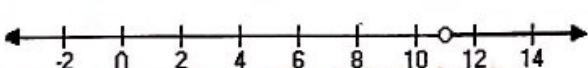

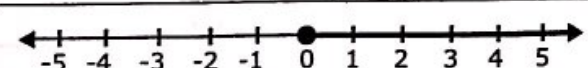
1.

2.

|         |         |
|---------|---------|
| < and > | ≥ and ≤ |
|         |         |

3.

### Practice Chart:

| Words                | Algebraic   | Graph  | Possible Solutions |
|----------------------|-------------|--|--------------------|
| B is greater than 6  |             |    |                    |
| J is fewer than 17   |             |  |                    |
|                      | $X > 3$     |  |                    |
|                      | $G \leq 52$ |  |                    |
|                      |             |  |                    |
| R is no more than 26 |             |  |                    |
|                      |             |  |                    |



### Inequality Practice: Real World Problems

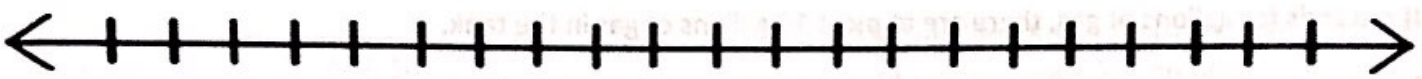
Name: \_\_\_\_\_

Period: \_\_\_\_\_

Write an inequality for each situation, then represent on a number line.

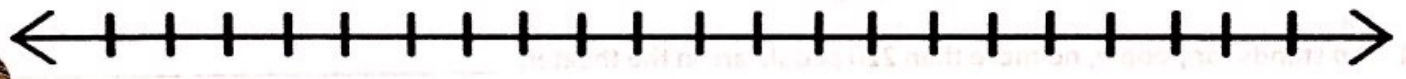
1. Jorge spent more than \$50 at the mall

Inequality: \_\_\_\_\_



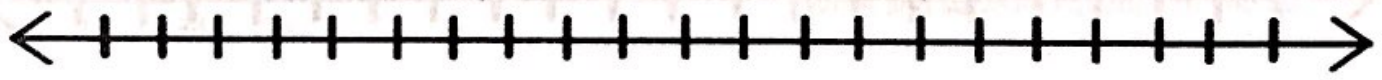
2. Water freezes at any temperature at or below 32° F.

Inequality: \_\_\_\_\_



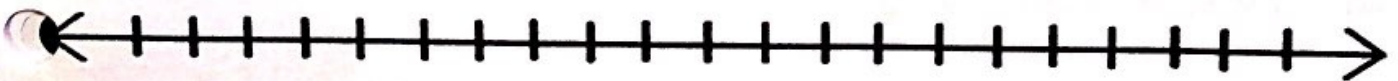
3. The speed limit on Holcomb Bridge Rd is 45 mph.

Inequality: \_\_\_\_\_



4. At least 150 people have to sign up for the Valentine's Dance.

Inequality: \_\_\_\_\_

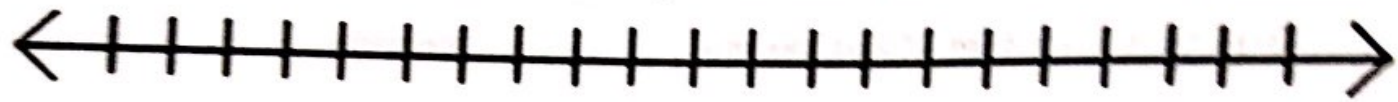


### Part III

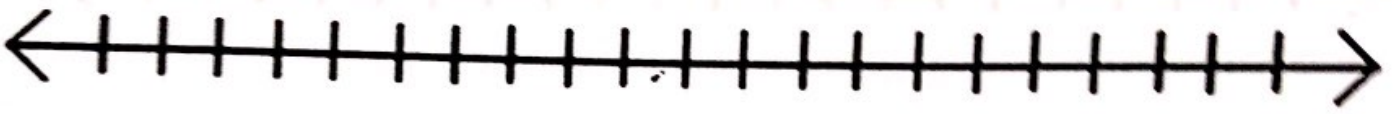
Write an inequality for each situation, then represent on a number line.

example: If  $p$  stands for people, there are at least 15 people in the waiting room. Answer:  $p \geq 15$

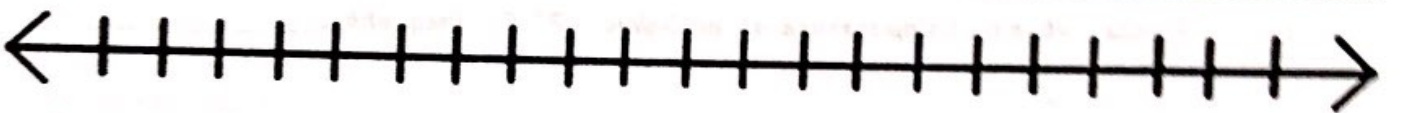
1. If  $p$  stands for people, the tram attendant will allow no more than 60 people on the tram. \_\_\_\_\_



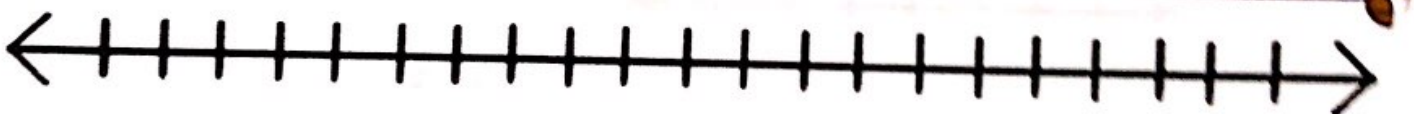
2. If  $g$  stands for gallons of gas, there are at most 10 gallons of gas in the tank. \_\_\_\_\_



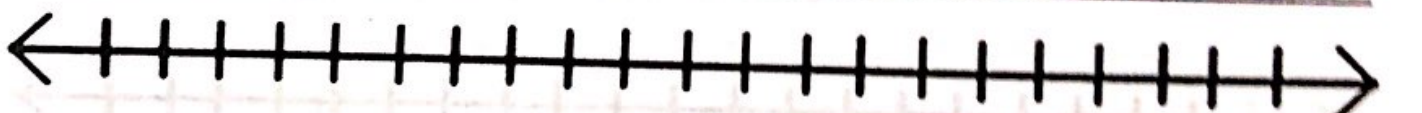
3. If  $y$  stands for yards of fabric, there is at least 10 yards of fabric left. \_\_\_\_\_



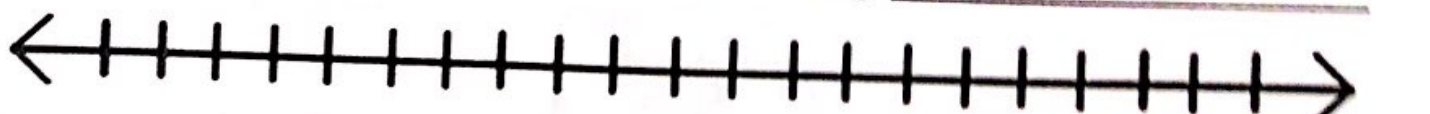
4. If  $p$  stands for people, no more than 220 people are in the theater. \_\_\_\_\_



5. If  $e$  stands for eggs, there are at least a dozen eggs left. \_\_\_\_\_



6. If  $p$  stands for people, fewer than 14 people attended the meeting. \_\_\_\_\_



## Unit 4 Study Guide: Equations and Inequalities

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

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

**Part 1: One Step Equations**

Identify the solution of each equation from the list given. Circle the solution.

1.  $s + 12 = 17$ ; 5, 6, 7

2.  $44 = t - 10$ ; 52, 53, 54

3.  $4r = 40$ ; 8, 9, 10

4.  $28 \div w = 7$ ; 3, 4, 5

Solve each equation. Check your solution.

5.  $4 + k = 11$   $k =$  \_\_\_\_\_

6.  $8w = 80$   $w =$  \_\_\_\_\_

7.  $a + 6 = 11$   $a =$  \_\_\_\_\_

8.  $17 = 9 + e$   $e =$  \_\_\_\_\_

9.  $24 = j - 34$   $j =$  \_\_\_\_\_

10.  $k - 12 = 4$   $k =$  \_\_\_\_\_

11.  $9b = 36$   $b =$  \_\_\_\_\_

12.  $80 = 10d$   $d =$  \_\_\_\_\_

13.  $m \div 9 = 5$   $m =$  \_\_\_\_\_

14.  $g \div 4 = 12$   $g =$  \_\_\_\_\_

Write an equation for each situation and solve it.

15. Fun Time Roller Coasters charges \$6 per ride. Joe spends \$54 on rides.

16. Bonnie has 27 more cans than Jackie. If she has 56 cans, write and solve an equation to find how many cans Jackie has.

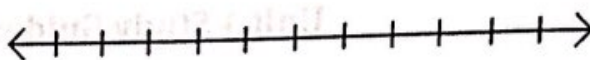
17. Cornelius is saving money to buy a jacket that costs \$47. He has already saved \$25. Write and solve an equation to find how much more money Cornelius needs to save.

18. Keshav has \$250 in his account. This is \$75 more than his brother Nalin has in his account. Write and solve an addition equation to find the amount of money in Nalin's account.

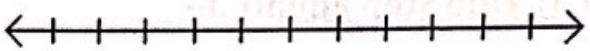
### Part 2: Inequalities

Write an inequality for each sentence.

- 19. More than 40,000 fans attended the opening football game at the University of Florida.

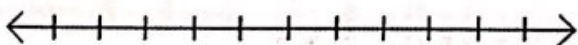


$$26. n + 17 < 35$$



$$27. 6x \geq 138$$

- 20. Her earnings were no more than \$86.



- 21. A savings account balance is now less than \$550.

$$28. 2 \leq x + 2$$

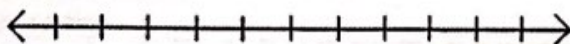
- 22. The number of club members is at least 25.



- 23. The spring calf class at the cattle show is for calves that weigh 825 pounds or less.

$$29. b - 26 < 2$$

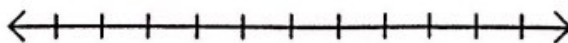
- 24. The minimum deposit for a new checking account is \$75.



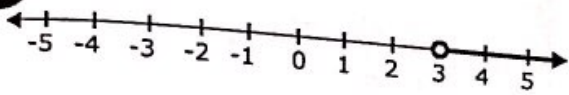
$$30. 18 \leq r + 11$$

Solve each inequality. Plot your solution on the number line under the inequality.

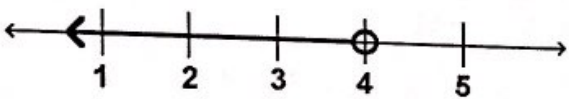
$$25. 14n > 266$$



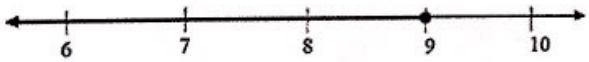
Write the inequality shown by each graph:



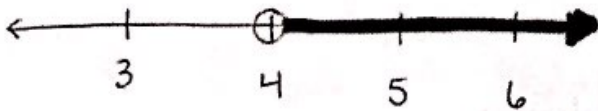
31. Inequality: \_\_\_\_\_



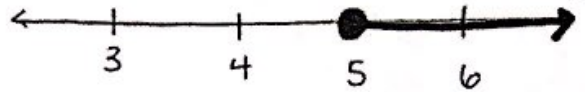
32. Inequality: \_\_\_\_\_



33. Inequality: \_\_\_\_\_



34. Inequality: \_\_\_\_\_



35. Inequality: \_\_\_\_\_

### Part 3: Functions

Write an equation for each function table and find the value for the missing output.

36. Equation: \_\_\_\_\_

| Input (x) | Output (y) |
|-----------|------------|
| 5         | 0          |
| 6         | 1          |
| 7         | 2          |
| 8         | 3          |
| 9         |            |

37. Equation: \_\_\_\_\_

| Input (x) | Output (y) |
|-----------|------------|
| 2         | 14         |
|           | 16         |
|           | 18         |
| 8         | 20         |
| 10        |            |

38. Equation: \_\_\_\_\_

| Input (x) | Output (y) |
|-----------|------------|
| 4         | 0          |
| 5         | 1          |
| 6         | 2          |
| 7         | 3          |
| 9         |            |

| Input (x) | Output (y) |
|-----------|------------|
| 1         | 11         |
| 2         | 22         |
| 3         | 33         |
| 4         | 44         |
| 6         |            |

39. Equation: \_\_\_\_\_

**Practice Free Response**

Mark has been earning money by mowing his neighbors' lawns. His goal for the summer is to have \$1,200 in his savings account. If he charges \$20 per lawn each time he mows, how long will it take him to reach his goal?

Step 1: Fill in the function table below:

|                    |                          |  |  |  |  |  |  |
|--------------------|--------------------------|--|--|--|--|--|--|
| <b>Lawns Mowed</b> |                          |  |  |  |  |  |  |
|                    | <b>Amount in Savings</b> |  |  |  |  |  |  |

Step 2: Write an equation to show the relationship between the number of lawns he mows and how much is in his savings account.

Step 3: How many weeks will it take Mark to reach his goal?