


# **Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet**

## **Kids' Information Page**

***We're so proud of you for taking the time to work on math over the summer!***

**Here are some helpful hints for success:**

- ☺ Find a quiet work space where you can get organized and stay focused.
- ☺ Pay close attention to the examples and vocabulary.
- ☺ It's ok to struggle, it allows you to self-monitor what you do and do not know.
- ☺ If you don't know how to do something, make note of it on the answer sheet, so you know to ask questions when you come back to school.
- ☺ Remember to persevere (Mathematical Practice #1)! Don't just give up after one attempt.
- ☺ Complete all of the problems in the packet.
- ☺ Calculators may **ONLY** be used when you see this symbol: 
- ☺ Remember to do a little work each week. **DO NOT** wait until the week before school starts to complete your packet!
- ☺ The packet should be returned to your math teacher during the first week of school.

***Have fun & we'll see you in August!***

# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

## Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

**Objective:** Write an algebraic expression to represent unknown quantities.



- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.

### Examples:

The sum of 5 and some number is written as:  $5 + n$  because the operation that is associated with the word **sum** is addition.

The difference of a number and three tenths is written as:  $n - .3$  because the operation that is associated with the word **difference** is subtraction.

1.)

a number plus  $\frac{1}{2}$

2.)

a number minus .7

3.)

the difference of twenty-one hundredths and a number

4.)

the sum of a number and forty-six

# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Evaluate an algebraic expression.

- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.
- **Multiplication** in algebra can be shown as  $4n$  or  $4 \times n$
- The variables in an algebraic expression can be replaced with any number.
- Once the variables have been replaced, you can **evaluate**, or find the value of, the algebraic expression.

Examples:

Evaluate  $44 + n$  if  $n = 9$        $44 + n$  original expression  
    $44 + 9$  replace the variable with it's value  
   53                    solution

1.)

Evaluate  $150 + n$  if  $n = 15$

2.)

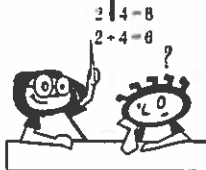
Evaluate  $12n$  if  $n = 9$

3.)

Evaluate  $15n + 19$  if  $n = \frac{1}{3}$

4.)

Evaluate  $30n$  if  $n = 2.5$



5.)

Evaluate  $24n \div k$  if  $n = 6$  and  $k = 8$

6.)

Evaluate  $nk - 2b + 8$  if  $b = 1.5$ ,  $k = 8$ , and  $n = 7$

# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Evaluate numeric expressions using order of operations.

- A **numerical expression** is a combination of numbers and operations.
- The **Order of Operations** tells you which operation to perform first so that everyone gets the same final answer.
- The **Order of Operations** is: **Parentheses, Exponents, Multiplication or Division (left to right), and Addition or Subtraction (left to right.)**

Examples:

$48 \div (3 + 3) - 2^2$  original expression  
 $48 \div 6 - 2^2$  simplify the expression inside the parentheses  
 $48 \div 6 - 4$  calculate  $2^2$   
 $8 - 4$  divide 48 by 6  
 $4$  subtract 4 from 8

1.)

$$(8 + 1) \bullet 12 - 13$$

2.)

$$13 \bullet 4 - 72 \div 8$$

3.)

$$88 - 16 \bullet 5 + 2 - 3$$

4.)

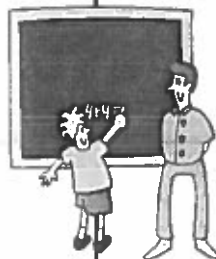
$$100 \div 5^2 \bullet 4^3$$

5.)

$$45 \div 9 - 3 + 2 \bullet 3$$

6.)

$$(5^2 + 3^3) \bullet (81 \div 9) \div 10$$



# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Determine the unknown in a linear equation (addition & subtraction).

- **Addition equations:** Subtract the same number from each side of the equation so that the two sides remain equal.
- **Subtraction equations:** Add the same number to each side of the equation so that the two sides remain equal.

Examples:

$$\begin{array}{r} b + 3 = 6 \quad \text{original equation} \\ - 3 \quad - 3 \quad \text{subtract 3 from each side} \\ \hline b + 0 = 3 \quad \text{solution} \\ b = 3 \quad \text{simplify} \end{array}$$

$$\begin{array}{r} b - 8 = 4 \quad \text{original equation} \\ + 8 \quad + 8 \quad \text{add 4 to each side} \\ \hline b + 0 = 12 \quad \text{solution} \\ b = 12 \quad \text{simplify} \end{array}$$

1.)

$$g + 5 = 12$$

2.)

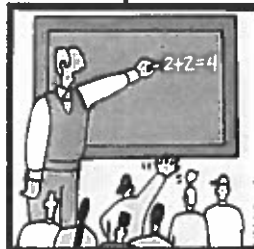
$$s - 12 = 29$$

3.)

$$m + 3.5 = 10.5$$

4.)

$$k - 5.5 = 8.5$$



5.)

$$w + 6.25 = 22$$

6.)

$$g - 3.75 = 49.75$$

# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

**Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS**

**Objective:** Determine the unknown in a linear equation (multiplication & division).

- In a **multiplication equation**, the number by which a variable is multiplied is called the **coefficient**. In the multiplication equation  $2x = 8$ , the coefficient is 2.
- **Multiplication equations:** Divide both sides by the coefficient so that the two sides remain equal.
- In a **division equation**, the number by which the variable is divided is called the **divisor**. In the division equation  $\frac{x}{4}$ , 4 is the divisor.
- **Division equations:** Multiply both sides of the equation by the divisor so that the two sides remain equal.

**Examples:**

$4b = 16$  original equation

$\frac{4b}{4} = \frac{16}{4}$  divide both sides by 4

$1b = 4$  solution

$b = 4$  simplify

$\frac{m}{6} = 11$  original equation

$6 \cdot \frac{m}{6} = 11 \cdot 6$  multiply each side by 6

$1m = 66$  solution

$m = 66$  simplify

1.)

$7x = 63$

2.)

$\frac{k}{9} = 8$

3.)

$5b = 3.55$

4.)

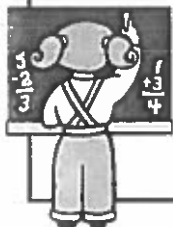
$\frac{n}{7} = 5.55$

5.)

$12m = 84.72$

6.)

$\frac{p}{13} = 2.67$



# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

## Unit: KNOWLEDGE of STATISTICS

**Objective:** Determine the measures of central tendency (mean, median, and mode) and the range.



A number that helps **describe all of the data** in a data set is a **measure of central tendency**.

The **mean** is the sum of the data divided by the number of pieces of data.

The **median** is the middle number of the ordered data (least to greatest.)

The **mode** is the number or numbers that occur most often.

The **range** is the difference between the greatest and least values of the data set.

### Examples:

Find the mean, median, mode, and range of the data.

$$\text{Mean} = \frac{25 + 34 + 39 + 41 + 45 + 52 + 27 + 22 + 56 + 61 + 15 + 27}{12}$$

$$= \frac{444}{12} = 37 \quad \text{The mean price of a jacket is \$37.}$$

| Jacket Prices (\$) |    |    |    |
|--------------------|----|----|----|
| 25                 | 34 | 39 | 41 |
| 45                 | 52 | 27 | 22 |
| 56                 | 61 | 15 | 27 |

$$\text{Median} = 15 \ 22 \ 25 \ 27 \ 27 \ 34 \ 39 \ 41 \ 45 \ 52 \ 56 \ 61 \text{ (data ordered)}$$

$$= \frac{34 + 39}{2} = 36.5 \quad \text{The median price of a jacket is \$36.50.}$$

Mode = **\$27** because it is the only piece of data that occurs more than once.

$$\text{Range} = 61 - 15 = \$46$$

1.) Find the mean, median, mode, and range for each set of data.

6, 9, 2, 4, 3, 6, 5

2.) Find the mean, median, mode, and range for each set of data.

13, 7, 17, 19, 7, 15, 11, 7, 21

3.) Find the mean, median, mode, and range for each set of data.

28, 32, 23, 43, 32, 27, 21, 34

4.) Find the mean, median, mode, and range for each set of data.

157, 124, 157, 124, 157, 139



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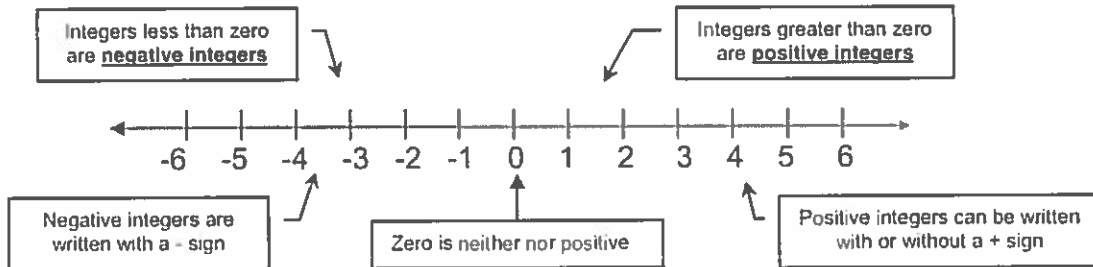
Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Read, write, and represent integers.



Examples:

Integer: Any number from the set {... -3,-2,-1,0,1,2,3...}



Write an integer to describe each situation

EX: a height increase of 3 inches

The word *increase* represents *positive*. The integer is 3 or +3.

EX: 50 feet below sea level

The word *below* represents *negative*. The integer is -50.

1.) Write an integer to describe:  
The stock market increased 75 points

2.) Write an integer to describe:  
A loss of 15 yards



3.) Write an integer to describe the situation:  
Nancy owes her friend \$10

4.) Write an integer to describe:  
Frederick is located 290 feet above sea level.

5.) Write an integer to describe:  
The temperature was 3° below zero



6.) Write an integer to describe:  
The 6<sup>th</sup> grade has 12 fewer students than last year



# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective: Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - A.**

**Examples:** Write  $\frac{21}{25}$  as a decimal

**Method 1:**

Change  $\frac{21}{25}$  to a fraction with a denominator of 10, 100, or 1000

**EX:**  $\frac{21}{25} = \frac{?}{100}$

(Use 100, since 25 divides into 100 evenly)

$$\frac{21}{25} = \frac{\bullet 4}{\bullet 4} = \frac{84}{100} \quad \frac{84}{100} = 0.84 \text{ as a decimal}$$

**Method 2:** Divide 21 by 25

$$\begin{array}{r} \frac{21}{25} \rightarrow 25 \overline{)21.00} \\ \underline{0.84} \\ 21.00 \\ \underline{-200} \\ 100 \\ \underline{-100} \\ 0 \end{array}$$

Therefore:  $\frac{21}{25} = 0.84$

1.) Write  $\frac{19}{20}$  as a decimal. Use method 1

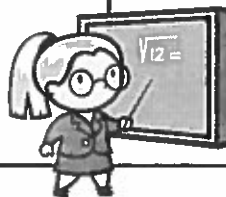
2.) Write  $\frac{7}{8}$  as a decimal. Use method 2.

3.) Write  $\frac{3}{16}$  as a decimal. Use method 2

4.) Write  $\frac{27}{40}$  as a decimal. Use method 2

5.) Write  $\frac{3}{4}$  as a decimal. Use method 1

6.) Write  $\frac{3}{5}$  as a decimal. Use method 1



# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - B.

**Key Concept:** Percent (%) is a ratio that compares a number to 100

**Fraction to Percent:**

EX: Change  $\frac{19}{25}$  to a percent

Since % means out of 100,  $\frac{19}{25} = \frac{?}{100}$

$$\frac{19}{25} = \frac{\bullet 4}{\bullet 4} = \frac{76}{100}$$

$$\frac{76}{100} = 76\%$$

**Percent to fraction:**

EX: Change 75% to a fraction in simplest form

75% means 75 out of 100

$$75\% = \frac{75}{100} \quad \text{Write the percent as a fraction with a denominator of 100}$$

$$\frac{75 \div 25}{100 \div 25} = \frac{3}{4} \quad \text{Simplify}$$

1.) Change  $\frac{17}{20}$  to a percent

2.) Change 84% to a fraction in simplest form

3.) Change  $\frac{3}{4}$  to a percent

4.) Change 90% to a fraction in simplest form

5.) Juan answered  $\frac{24}{25}$  questions correctly on his quiz.  
What percent of the questions did he get correct?

6.) 78% of the class completed their homework last night. What fraction of the class completed their homework?



## Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - C.

**Key Concept:** Ratio: a comparison of two numbers

A ratio can be written in 3 ways: a:b

a to b or

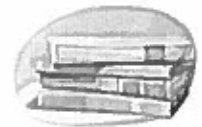
$\frac{a}{b}$

**EX:** Write the ratio as a fraction simplest form: 4 wins to 6 losses

Since the ratio can be written as:  $\frac{4}{6}$  we can simplify to  $\frac{2}{3}$  or 2:3 or 2 to 3

1.) Write the ratio as a fraction simplest form:  
12 boys to 15 girls

2.) Write the ratio as a fraction simplest form:  
20 books to 24 magazines



3.) Write the ratio as a fraction simplest form:  
10 circles to 15 triangles

4.) Write the ratio as a fraction simplest form:  
8 cups to 2 servings

5.) Write the ratio as a fraction simplest form:  
50 cars to 100 trucks



6.) Write the ratio as a fraction simplest form:  
9 pencils to 11 pens

# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Multiply fractions and mixed numbers and express answers in simplest form.

**Multiplying Fractions and Mixed Numbers:**

- 1) Change Mixed numbers to improper fractions
- 2) Multiply numerators
- 3) Multiply denominators
- 4) Simplify if necessary

**EX: multiply**  $\frac{1}{2} \times \frac{3}{8}$

- 1) **No mixed numbers**
- 2)  $\frac{1}{2} \times \frac{3}{8} = \frac{3}{16}$
- 3)  $\frac{1}{2} \times \frac{3}{8} = \frac{3}{16}$
- 4) (can't be simplified)

**EX: Multiply**  $\frac{1}{3} \times 6\frac{3}{7}$

- 1)  $6\frac{3}{7} = \frac{45}{7}$  as an improper fraction
- 2)  $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 3)  $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 4) Simplified:  $\frac{45}{21} = 2\frac{1}{7}$

1.)  $\frac{5}{6} \times \frac{1}{2} =$

2.)  $\frac{9}{10} \times \frac{2}{3} =$

3.)  $2\frac{1}{2} \times 1\frac{2}{5} =$

4.)  $2\frac{1}{4} \times 3\frac{1}{3} =$

5.) Belinda lives  $1\frac{1}{2}$  times further from school than Jamie does. If Jamie lives  $4\frac{1}{5}$  miles from school, how far does Belinda live?

6.) Mario practices his guitar every day for  $\frac{3}{4}$  of an hour. How long does he practice for week?



## Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Determine 10, 20, 25, or 50 percent of a whole number.

**Example: Determine 25% of 40**

**Method 1:**

**Change the percent to a fraction and multiply**

$$25\% = \frac{1}{4}$$

$$\frac{1}{4} \times 40 = 10$$

**Therefore 25% of 40 is 10.**

**Method 2:**

**Change the percent to a decimal and multiply**

$$25\% = 0.25$$

$$0.25 \bullet 40 = 10.00$$

**Therefore 25% of 40 is 10.**

$$\begin{array}{r} 40 \\ \times 0.25 \\ \hline 200 \\ +800 \\ \hline 10.00 \end{array}$$

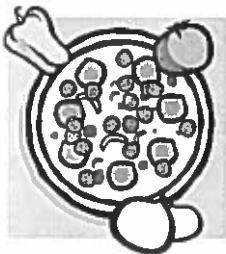
1.) Determine 20% of 65.

2.) Determine 50% of 120.

3.) Determine 25% of 20.

4.) Determine 10% of 35.

5.) 20% of the 250 students ate pizza for lunch. How many students ate pizza?



6.) Nia saved 10% on her CD purchase. If the CD originally cost \$24.90, how much did she save?

# Incoming 7<sup>th</sup> Grade Standard– Summer Math Packet

## Answer Key

### Page 2

| Answer               | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|----------------------|--------------------------------------|----------------------------|-----------------|
| 1. $x + \frac{1}{2}$ |                                      |                            |                 |
| 2. $x - 7$           |                                      |                            |                 |
| 3. $0.21 - x$        |                                      |                            |                 |
| 4. $x + 46$          |                                      |                            |                 |

### Page 3

| Answer | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|--------|--------------------------------------|----------------------------|-----------------|
| 1. 165 |                                      |                            |                 |
| 2. 108 |                                      |                            |                 |
| 3. 24  |                                      |                            |                 |
| 4. 75  |                                      |                            |                 |
| 5. 18  |                                      |                            |                 |
| 6. 61  |                                      |                            |                 |

### Page 4

| Answer  | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|---------|--------------------------------------|----------------------------|-----------------|
| 1. 95   |                                      |                            |                 |
| 2. 43   |                                      |                            |                 |
| 3. 7    |                                      |                            |                 |
| 4. 256  |                                      |                            |                 |
| 5. 8    |                                      |                            |                 |
| 6. 46.8 |                                      |                            |                 |

### Page 5

| Answer         | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|----------------|--------------------------------------|----------------------------|-----------------|
| 1. $g = 7$     |                                      |                            |                 |
| 2. $s = 41$    |                                      |                            |                 |
| 3. $m = 7$     |                                      |                            |                 |
| 4. $k = 14$    |                                      |                            |                 |
| 5. $w = 15.75$ |                                      |                            |                 |
| 6. $g = 53.5$  |                                      |                            |                 |

### Page 6

| Answer         | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|----------------|--------------------------------------|----------------------------|-----------------|
| 1. $x = 9$     |                                      |                            |                 |
| 2. $k = 72$    |                                      |                            |                 |
| 3. $b = 0.71$  |                                      |                            |                 |
| 4. $h = 38.85$ |                                      |                            |                 |
| 5. $m = 7.06$  |                                      |                            |                 |
| 6. $p = 34.71$ |                                      |                            |                 |

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Page 7

| Answer  | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|---|--------------------------------------|----------------------------|-----------------|
| 1. Mean: 5<br>Median: 5<br>Mode: 6<br>Range: 7        |                                      |                            |                 |
| 2. Mean: 5<br>Median: 5<br>Mode: 6<br>Range: 7        |                                      |                            |                 |
| 3. Mean: 13<br>Median: 13<br>Mode: 7<br>Range: 14     |                                      |                            |                 |
| 4. Mean: 30<br>Median: 30<br>Mode: 32<br>Range: 22    |                                      |                            |                 |
| 5. Mean: 143<br>Median: 148<br>Mode: 157<br>Range: 33 |                                      |                            |                 |

Page 8

| Answer | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|--------|--------------------------------------|----------------------------|-----------------|
| 1. 75  |                                      |                            |                 |
| 2. -15 |                                      |                            |                 |
| 3. -10 |                                      |                            |                 |
| 4. 290 |                                      |                            |                 |
| 5. -3  |                                      |                            |                 |
| 6. -12 |                                      |                            |                 |

Page 9

| Answer   | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|----------|--------------------------------------|----------------------------|-----------------|
| 1. 0.95  |                                      |                            |                 |
| 2. 0.875 |                                      |                            |                 |
| 3. 0.187 |                                      |                            |                 |
| 4. 0.675 |                                      |                            |                 |
| 5. 0.75  |                                      |                            |                 |
| 6. 0.6   |                                      |                            |                 |

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Page 10

| Answer             | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|--------------------|--------------------------------------|----------------------------|-----------------|
| 1. 85%             |                                      |                            |                 |
| 2. $\frac{21}{25}$ |                                      |                            |                 |
| 3. 75%             |                                      |                            |                 |
| 4. $\frac{9}{10}$  |                                      |                            |                 |
| 5. 96%             |                                      |                            |                 |
| 6. $\frac{39}{50}$ |                                      |                            |                 |

Page 11

| Answer            | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|-------------------|--------------------------------------|----------------------------|-----------------|
| 1. $\frac{4}{5}$  |                                      |                            |                 |
| 2. $\frac{5}{6}$  |                                      |                            |                 |
| 3. $\frac{2}{3}$  |                                      |                            |                 |
| 4. $\frac{4}{1}$  |                                      |                            |                 |
| 5. $\frac{1}{2}$  |                                      |                            |                 |
| 6. $\frac{9}{11}$ |                                      |                            |                 |

Page 12

| Answer             | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|--------------------|--------------------------------------|----------------------------|-----------------|
| 1. $\frac{5}{18}$  |                                      |                            |                 |
| 2. $\frac{3}{5}$   |                                      |                            |                 |
| 3. $3\frac{1}{2}$  |                                      |                            |                 |
| 4. $7\frac{1}{2}$  |                                      |                            |                 |
| 5. $6\frac{3}{10}$ |                                      |                            |                 |
| 6. $5\frac{1}{4}$  |                                      |                            |                 |



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Page 13

| Answer    | I got it on the 1 <sup>st</sup> try! | I got it with corrections. | I have no idea. |
|-----------|--------------------------------------|----------------------------|-----------------|
| 1. 13     |                                      |                            |                 |
| 1. 60     |                                      |                            |                 |
| 2. 5      |                                      |                            |                 |
| 3. 3.5    |                                      |                            |                 |
| 4. 50     |                                      |                            |                 |
| 5. \$2.49 |                                      |                            |                 |

