Math 7

Assignments for

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*Mrs. Evick's and Mr. Fields' advanced 7th grade classes 3rd period have additional assignments.

The following packet contains your assignments for the weeks of March 16-27. Each day has a separate assignment. The dates are at the top of each page. Most days have a front and a back. There are also directions at the top of each assignment - READ THEM! You will find some pages of notes on each topic after the pages of assignments. These are not more work, just notes and examples to help you do the assignments.

Other sources of help include emailing your teaching at the above address, looking things up in your book (your book is online if you go to clever.com and click on the Big Ideas link and choose your book –MRL – the ebook choice is the easiest to use), KHAN Academy is a great website for math lessons by teachers, finding same topic on Aleks and reading the explanations or watch the tutoring videos, ask older siblings or relatives, or google it. PLEASE READ THE DIRECTIONS BEFORE EACH SET OF PROBLEMS.

Please attempt every problem. If you are viewing the packet online, you should write the problems down on paper and show your work.

3/19/2020 Name _____

Addition & Subtraction Teacher _____

The use of a calculator is not permitted on this assignment. This means you ***MUST*** show your work to receive credit!

For problems 1 – 6, determine whether the value is positive (+) or negative (-) and explain in a sentence how you know. **NOTE**: This does not ask you to evaluate. You only need to determine the sign of the value.

1. $-32-(-25)$ Choose: (+) or (-)

   Explain: _____

2. $27-36$ Choose: (+) or (-)

   Explain: _____

3. $\frac{4}{5}-\frac{1}{2}$ Choose: (+) or (-)

   Explain: _____

4. $-\frac{2}{5}+\frac{3}{10}$ Choose: (+) or (-)

   Explain: _____

5. $-3.76+3.8$ Choose: (+) or (-)

   Explain: _____

6. $-2.5+(-1.3)$ Choose: (+) or (-)

   Explain: _____

3/19/2020 Name _____

Addition & Subtraction Teacher _____

The use of a calculator is not permitted on this assignment. This means you ***MUST*** show your work to receive credit!

For problems 7 – 12, evaluate the sum or difference. SHOW YOUR WORK or EXPLAIN how you evaluated the sum or difference without the use of a calculator.

7. $-27-(-15)$

8. $73-91$

9. $\frac{6}{7}-\frac{1}{4}$

10. $-\frac{4}{7}+\frac{9}{14}$

11. $-0.43+3.9$

12. $-5.3+(-2.8)$

3/20/2020 Name _____

Multiplication Teacher _____

The use of a calculator is not permitted on this assignment. This means you ***MUST*** show your work to receive credit!

For problems 1 – 4, determine whether the value is positive (+) or negative (-) and explain in a sentence how you know. **NOTE**: This does not ask you to evaluate. You only need to determine the sign of the value.

1. $16 \cdot 5$ Choose: (+) or (-)

   Explain: _____

2. $22 \cdot -9$ Choose: (+) or (-)

   Explain: _____

3. $-\frac{3}{4} \cdot \frac{5}{3}$ Choose: (+) or (-)

   Explain: _____

4. $-1.86 \cdot -7.3$ Choose: (+) or (-)

   Explain: _____

For problems 5 – 12, evaluate the product. Simplify fractions as necessary. SHOW YOUR WORK or EXPLAIN how you evaluated the product without the use of a calculator.

5. $12 \cdot 7$

6. $-8 \cdot 16$

3/20/2020 Name _____

Multiplication Teacher _____

The use of a calculator is not permitted on this assignment. This means you ***MUST*** show your work to receive credit!

7. $-\frac{2}{5} \cdot -\frac{1}{5}$

8. $-\frac{2}{9} \cdot \frac{9}{4}$

9. $-2.35 \cdot 3.6$

10. $-5.1 \cdot (-5.1)$

11. $-6 \cdot \frac{3}{8}$

12. $3 \cdot 2.77$

3/23/2020 Name _____

Division Teacher _____

The use of a calculator is not permitted on this assignment. This means you ***MUST*** show your work to receive credit!

For problems 1 – 4, determine whether the value is positive (+) or negative (-) and explain in a sentence how you know. **NOTE**: This does not ask you to evaluate. You only need to determine the sign of the value.

1. $6 \div 9$ Choose: (+) or (-)

   Explain: _____

2. $27 \div -7$ Choose: (+) or (-)

   Explain: _____

3. $-\frac{1}{3} \div \frac{3}{2}$ Choose: (+) or (-)

   Explain: _____

4. $-4.26 \div -0.11$ Choose: (+) or (-)

   Explain: _____

For problems 5 – 12, evaluate the quotient. Simplify fractions as necessary. Do not round decimals. SHOW YOUR WORK or EXPLAIN how you evaluated the quotient without the use of a calculator.

5. $13 \div 4$ (do not write this quotient as a fraction)

6. $-8 \div 18$

3/23/2020 Name _____

Division Teacher _____

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7. $-\frac{5}{6} \div -\frac{2}{3}$

8. $-\frac{1}{8} \div \frac{3}{4}$

9. $-8.75 \div 1.25$

10. $-3.7 \div (-3.7)$

11. $-6 \div \frac{2}{5}$

12. $10.44 \div 3$

3/24/2020

Name _____

Solving Equations (One & Two-Step Equations)

Teacher _____

You ***MUST*** show your work to receive credit!

Solve each equation for the variable. Show your work by listing the steps taken to solve each equation.

1. $x + 9 = -4$

2. $-4p = -28$

3. $-2.8 = \frac{b}{7}$

4. $y + \frac{3}{5} = -\frac{2}{3}$

5. $\frac{3}{7}w = \frac{9}{14}$

3/24/2020

Name _____

Solving Equations (One & Two-Step Equations)

Teacher _____

You ***MUST*** show your work to receive credit!

6. $2y + 5 = 19$

7. $-24 + 3r = 9$

8. $\frac{m}{-3} + 8 = 5$

9. $7 = \frac{a}{5} + 3$

10. $\frac{1}{5}k - 2 = 3$

3/25/2020 Name _____

Solving Equations (Combining Like Terms & Distributive Property) Teacher _____

You ***MUST*** show your work to receive credit!

Solve each equation for the variable. Show your work by listing the steps taken to solve each equation.

1. EXAMPLE (Combine Like Terms): $4 = 6r + 2 - 4r$

$4 = 6r + 2 - 4r$ → Combine "like terms" → ★Same variable ★Same exponent

$4 = 6r - 4r + 2$ → Simplify

$4 - 2 = 2r + 2 - 2$ → Solve

$\frac{2}{2} = \frac{2r}{2}$

$1 = r$ ← Solution

★Check

$4 \stackrel{?}{=} 6(1) + 2 - 4(1)$

$4 \stackrel{?}{=} 6 + 2 - 4$

$4 = 8 - 4$

$4 = 4$ ✓

2. $-2v - 5v = -28$

3. $n + 5 + 5n = -1$

4. $-5x - 3x = 8$

5. $-2k - 5 - 4k = 7$

3/25/2020 Name _____

Solving Equations (Combining Like Terms & Distributive Property) Teacher _____

You ***MUST*** show your work to receive credit!

6. EXAMPLE (Distributive Property): $76 = 5(6x - 1) - 3x$

$76 = 5(6x-1) - 3x$ ↘ Distribute → The term multiplying on the group is distributed to multiply to each term in the group (inside parentheses).

$76 = 30x - 5 - 3x$ ↙

$76 = 27x - 5$ ↙ Combine Like Terms

$+5 \quad +5$ ↙ Solve

$\frac{81}{27} = \frac{27x}{27}$

$3 = x$ ← Solution

7. $105 = 5(1 + 4r)$

8. $96 = 4(5p - 1)$

9. $-102 = -6(2 - 5m)$

10. $5(1 - 2n) - 3 = 62$

3/26/2020

Name _____

Ratios & Proportions

Teacher _____

You ***MUST*** show your work to receive credit!

1. You mix $\frac{1}{4}$ cup of red paint for every $\frac{1}{2}$ cup of blue paint to make purple paint.

   a. How much purple paint will be made from $\frac{1}{4}$ cup of red paint and $\frac{1}{2}$ cup of blue paint?

   b. How much red paint and blue paint do you need to make 3 gallons of purple paint? (16 cups : 1 gallon)

2. Find the unit price (cost per pound) of feed if you get 50 pounds of feed for $12.

3. Determine whether *x* and *y* are proportional.

x	2	4	6	8	10
y	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$

4. Tell whether the ratios 3.5 : 2 and 14 : 8 form a proportion.

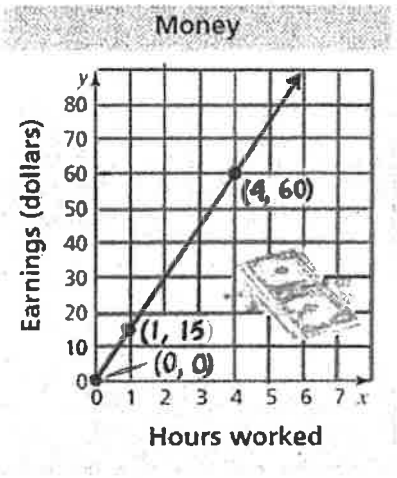
5. Solve the proportion. $\frac{15}{8} = \frac{45}{c}$

3/26/2020 Name _____

Ratios & Proportions Teacher _____

You ***MUST*** show your work to receive credit!

6. The graph shows the money earned in relation to the number of hours worked. Tell whether x and y are proportional. If so, find the constant of proportionality. Then find the amount of money earned in 8 hours.



Proportional? Yes or No

Constant of Proportionality: $k =$ _____

Money earned in 8 hours: $ _____

7. A scale drawing of a 32 foot tall building is 8 inches tall.
   a. What is the scale of the drawing?

   b. What is the scale factor of the drawing?

3/27/2020

Name _____

Percents

Teacher _____

You ***MUST*** show your work to receive credit!

For problems 1 – 3, write each as a fraction, decimal, and percent.

	Fraction	Decimal	Percent
1.	_____	_____	36%
2.	_____	.64	_____
3.	$\frac{8}{25}$	_____	_____

4. Find 27% of 50.

5. 56% of what number is 89.6?

6. 7 out of 20 people prefer fried bologna sandwiches for lunch. What percent does not prefer fried bologna sandwiches for lunch?

3/27/2020 Name _____

Percents Teacher _____

You ***MUST*** show your work to receive credit!

7. Find the percent of change if the price of gas was $3.50 in 2013 and $2.00 in 2020.

8. If airpods that costs $90 is discounted 30% off, how much would you pay if you add on a 6% sales tax?

9. If you borrow $2000 for 3 years at 4% simple interest, how much will the interest be?

Study Guide - Chapter 2

Integers

To add: 1. When the signs are the same → add the two numbers; answer gets same sign as problem

examples: $5+2=7$ $\quad -5+-2=-7$

2. When the signs are different → subtract the two numbers; answer gets sign of "bigger" amount.

examples: $-5+2=-3$ $\quad 5+-2=3$

To subtract: add the opposite (the first number stays the same, change to addition problem, change second number to its opposite sign); then follow addition rules

examples: $6--2=$ $\quad -4--6=$

$6+2=8$ $\quad -4+6=2$

To multiply or divide: multiply or divide normally, if the two numbers have the same sign → the answer is positive; if the numbers have different signs → the answer is negative

When multiplying more than 2 numbers:

- an even number of negative signs makes answer positive
- an odd amount of negative signs makes answer negative

Study Guide – Preparing for Fraction Operations

Prime numbers – numbers that have only/exactly 2 factors – 1 and itself

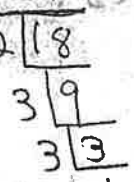
examples: 2, 3, 5, 7, 11, 13, 17, 19, ...
(use your chart)

Composite numbers – have more than 2 factors
example: 8 – 1×8 and 2×4

Prime Factorization – breaking a number down to only prime factors by using a factor tree or cake method

example – **factor tree** (break it down or bring it down)

cake method – only use prime numbers outside (see chart)



GCF – Greatest Common Factor of 2 numbers is the biggest number that will go into both numbers (can not be bigger than the smaller number)

Example 1 – List all Factors
8 – 1, 2, 4, 8
12 – 1, 2, 3, 4, 6, 12
GCF = 4

Example 2 – Use Prime Factorization (use only numbers they have in common)
8 – 2 · 2 · 2
12 – 2 · 2 · 3
GCF = 2 · 2 = 4

LCM – Least Common Multiple of 2 numbers is the first number that they both go into (must be at least as big as largest number)

Method 1 – List all multiples
8 – 8, 16, 24, 32, 40
12 – 12, 24, 36, 48
LCM = 24

Method 2 – Prime Factorization (use numbers they have in common + left overs)
8 – 2 · 2 · 2
12 – 2 · 2 · 3
LCM = 2 · 2 · 2 · 3 = 24

To reduce a fraction to <u>simplest form</u> - divide the top and bottom by the GCF (same number); check to make sure it won't reduce more

Example: $\frac{20 \div 4}{24 \div 4} = \frac{5}{6}$ or $\frac{20 \div 2}{24 \div 2} = \frac{10 \div 2}{12 \div 2} = \frac{5}{6}$

To change a <u>fraction to a decimal</u> - divide the numerator (top number) <u>by</u> the denominator (bottom)

Example: $\frac{4}{5} = 5\overline{)4.0}$ (0.8 terminated)
-40
0

$\frac{2}{3} = 3\overline{)2.000}$ (0.666... repeating)
-18
20
-18
20
-18
2

To change a <u>percent to a decimal</u> - move the decimal 2 places to the left or <u>divide</u> by 100

Examples: $40\% = 40.\% = 0.4$ $24.5\% = 24.5\% = 0.245$
$7\% = 07.\% = 0.07$

To change a <u>decimal to a percent</u> - move the decimal 2 places to the right or multiply by 100

Examples: $0.5 = 0.50 = 50\%$ $3.49 = 349\%$

To change a <u>fraction to a percent</u>
1. if it has 100 in denominator, the top number is the percent → $\frac{14}{100} = 14\%$
2. if the bottom number goes into 100, change it → $\frac{4}{5} = \frac{80}{100} = 80\%$
3. or divide and move decimal 2 places → $\frac{1}{8} = 8\overline{)1.000} = 12.5\%$
-8
20
-16
40
-40
0

To change a <u>percent to a fraction</u> - put the percent over 100 and reduce
ex. $40\% = \frac{40}{100} = \frac{4}{10} = \frac{2}{5}$

To <u>compare or order</u> numbers → make all numbers the same form (all fractions w/ common denominator <u>or</u> all % <u>or</u> all decimals)

Study Guide – Fractions (+, −, ×, ÷)

To estimate: mixed numbers get rounded to the nearest whole number; if the fraction part is ½ or more, round up

ex. $4\frac{3}{9} + 6\frac{7}{8} \rightarrow 4 + 7 = 11$

($4\frac{3}{9} \rightarrow 3$ is less than ½ of 9, so round down = 4)

($6\frac{7}{8} \rightarrow 7$ is more than ½ of 8, so round up = 7)

To estimate fractions only – round to the closest of 0, ½, or 1.

ex. $\frac{2}{7} + \frac{4}{7} + \frac{6}{7}$

$0 = \frac{0}{7}$

$\frac{1}{2} = \frac{3.5}{7}$

$1 = \frac{7}{7}$

($\frac{2}{7}$ is closest to $\frac{0}{7}$ so round to 0)

($\frac{4}{7}$ is closest to $\frac{3.5}{7}$, so round to ½)

($\frac{6}{7}$ is closest to $\frac{7}{7}$, so round to 1)

so the problem becomes $0 + \frac{1}{2} + 1 = 1\frac{1}{2}$

To add or subtract fractions, you must get a common denominator

ex. $\frac{2}{5} + \frac{1}{3}$ → the bottom numbers don't match, so find multiples of each until you get a match

(over)

multiples of each denominator

5 - 5, 10, (15), 20

3 - 3, 6, 9, 12, (15) — matches, use 15 for denominators

$\frac{2}{5} + \frac{1}{3}$ → $\frac{2}{5} + \frac{1}{3}$ (×3 on top, ×5 on bottom) → $\frac{2}{3} + \frac{1}{3}$ (×3 on top) → $\frac{6}{15} + \frac{5}{15}$ — top must also get 5 times bigger

$\frac{\quad}{15} + \frac{\quad}{15}$ → $\frac{\quad}{15} + \frac{\quad}{15}$

so $\frac{6}{15} + \frac{5}{15} = \frac{11}{15}$

To <u>multiply</u> – turn all numbers to fractions, then just multiply top × top and bottom × bottom

ex. $4 \times 3\frac{1}{2} \Rightarrow \frac{4}{1} \cdot \frac{7}{2} = \frac{28}{2} = 14$

(To turn (mixed number) $3\frac{1}{2}$ <u>to a fraction</u>, multiply the bottom by the big number, then add the top number; the bottom stays the same.

$2 \times 3 = 6$, $6 + 1 = 7 \rightarrow \frac{7}{2}$)

To <u>divide</u> – turn all numbers to fractions, then multiply by the reciprocal → Keep, change, flip

ex. $\frac{2}{5} \div \frac{4}{1} \Rightarrow \frac{2}{5} \cdot \frac{4}{1} \Rightarrow \frac{8}{5} = 1\frac{3}{5}$

(Keep) (change) (flip)

To <u>simplify</u> an improper fraction → divide top by bottom

ex. $\frac{8}{5} \Rightarrow$ $5\overline{)8}$ $\quad 1$ remainder 3 $= 1\frac{3}{5}$

-5

3

Study Guide – Ratios & Proportions

Key

Ratio – a comparison of 2 quantities

ex. The water rises $\frac{1}{2}$ in every 2 hours =

$\frac{\frac{1}{2}\text{ in}}{2\text{ h}}$ or $\frac{1}{2}\text{ in} : 2\text{ h}$

Value of the Ratio – divide

$\frac{\frac{1}{2}\text{ in}}{2\text{ h}}$ means $\frac{1}{2} \div 2 = 0.25$ or $\frac{1}{4}$

To Find missing values in a ratio table either

1. Work your way across the table from left to right figuring out what it takes to make the next column

ex.

x	4	16	8
y	$\frac{1}{2}$	2	1

(×4, ÷2 above; ×4, ÷2 below)

or

2. Divide any column where you know the x and the y to find the value of the ratio, then use that number on each column to find the missing part by dividing or multiplying.

ex.

x	4	16	8
y	$\frac{1}{2}$	2	1

$4 \div \frac{1}{2} = 8$ → so use 8 every time

$16 \div 8 = 2$

$1 \times 8 = 8$

p. 2 - Ratios & Proportions

Unit Rate - how much for each one → Divide

ex. You buy 12 roses for $60.00. What is the unit rate or price per rose?

$60 ÷ 12 = 5 $ per rose

Proportion - when 2 ratios are equivalent (equal)

$\frac{1}{2} = \frac{3}{6}$

You can check for proportionality by dividing each ratio to see if they are equal

$1 \div 2 = 0.5$ ($\frac{1}{2}$) and $3 \div 6 = 0.5$ ($\frac{1}{2}$) (yes or no)

or you can cross multiply to see if those products are the same/equal

$\frac{1}{2} = \frac{3}{6}$ $1 \times 6 = 6$ and $3 \times 2 = 6$

To **Solve a Proportion** - means to find the missing number when you already know they are equal

1. Cross multiply
2. Divide

$\frac{1}{2} = \frac{3}{x}$

$1 \cdot x = 3 \cdot 2$

$1x = 6$

$1x = 6$

$\frac{1x}{1} = \frac{6}{1}$

$x = 6$

Your turn: $\frac{4}{5} = \frac{10}{x}$

$4 \cdot x = 5 \cdot 10$

$4x = 50$

$\frac{4x}{4} = \frac{50}{4}$

$x = 12.5$

p. 3 – Ratios & Proportions

If a Graph is showing a proportional relationship,

1. It will be a straight line.
2. It will go through the origin. (0, 0)

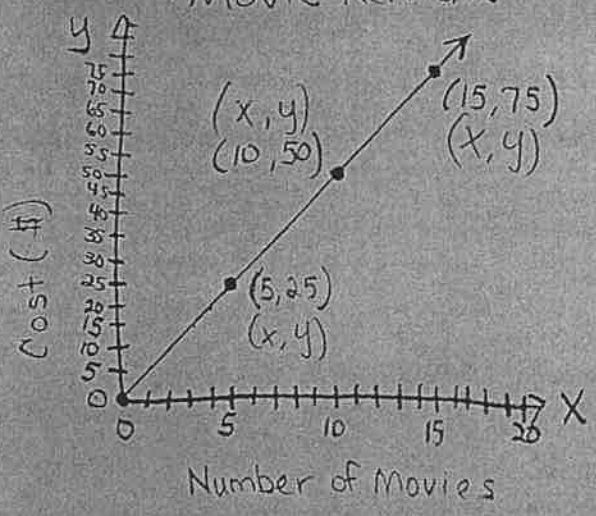
It can then be written in an equation that looks like this → $y = k \cdot x$.

Where K is called the Constant of Proportionality.

(The rate or the amount you multiply the "x" numbers by to get the "y" numbers.)

To find the Constant of Proportionality (K), divide any y by its corresponding x number.

$$K = \frac{y}{x}$$ which is how much for 1.



Your Turn

$K = \frac{25}{5} = \frac{\$5}{}$ per ~~rose~~ movie

Find the cost of renting 12 movies.

$12(\$5) = \$60$

Scale Drawings or Models are proportional to the actual item but are reduced or enlarged by a scale number

A Scale - compares the picture/model measurement to the real thing's measurement. (usually have different units)

A Scale Factor - must be converted to have the units match to compare the picture or model to the actual measurement.

ex. Model of Building Real Building

$$\text{Scale} = \frac{4\text{ in.}}{20\text{ ft}} \text{ or simplifies to } \frac{1\text{ in.}}{5\text{ ft}} \quad \text{must label}$$

$$\text{Scale Factor} = \frac{1\text{ in.}}{5\text{ ft}} \Rightarrow \frac{1\text{ in.}}{60\text{ in.}} = \frac{1}{60}$$

So, the model is $\frac{1}{60}$ the size of the actual building,
Or the actual building is 60 times the size of the model.

6-1

Converting between Percents & Fractions

6-1

Converting Between Percents & Decimals

Chapter 6

Study Guide

Mrs. Long

6.3

Percent Equation

(or use proportion)

←

6.2

Percent Proportion

6.6

Simple Interest

6.4

Percent of Change

(increase or decrease or error)

6.5

Finding Original Price

6.5

Discount (on sale) or Markup (sales tax)

To change % to decimal
- divide by 100 or move decimal 2 places left

ex. 24% = 24 = 0.24

5% = 5 = 0.05

120% = 120 = 1.20

To change decimal to %
- multiply by 100 or move decimal 2 places right

ex. 0.37 = 0.37 = 37%

0.4 = 0.4 = 40%

*put a percent sign on it! (%)

To change from fraction to a decimal, then a percent

method 1 - Turn it into a fraction over 100 if poss.

ex. $\frac{1}{4} \rightarrow \frac{\quad}{100}$; $\frac{1}{4} \xrightarrow{\times 25} \frac{25}{100}$ (.25)

*put a % on it

method 2 - Divide top by bottom to turn frac. into decimal, then move dec. 2 places right

ex. $\frac{1}{4}$ → 4)1.00 (0.25) → 0.25 = 25%

-8
20
-20
0

ex. What is 15% of 20?

$\frac{x}{20} = \frac{15}{100}$

$100x = 20(15)$

$100x = 300$

$x = 3$

$\frac{\text{part}}{\text{whole}} \boxed{\frac{\text{is}}{\text{of}} = \frac{\%}{100}} \frac{\text{part of \%}}{\text{whole \%}}$

1. Cross Multiply
2. Divide

* If % was missing, put a % sign on answer

$\boxed{\% \cdot \text{of} = \text{is}}$

(percent · total = part)

- change % to decimal
- then multiply or divide as needed.

* Does your answer need % sign?

ex. What is 15% of 20

$15\% \cdot 20 = x$

$.15 \cdot 20 = x$

$3 = x$

ex. What % of 20 is 3?

$x \cdot 20 = 3$

$x = \frac{3}{20}$

$x = .15 = 15\%$

ex. original (first) - 20
new - 18

$\frac{20-18}{20} = \frac{2}{20} = 0.1 = 10\%$ decrease

label increase or decrease

$\boxed{\%\text{ of change} = \frac{\text{amount of change}}{\text{original amount}}}$

$\%\text{ of error} = \frac{\text{amount off}}{\text{actual or goal}}$

* To find the amount it changed, subtract the new minus the original, then divide & move decimal to get %.

$\boxed{I = prt}$

Interest = principal · rate · time

(I = $ · % · yr)

* make % a decimal
- works for borrowing or saving

ex. You borrow $1000 for 2 years at a rate of 5%. How much interest will you have to pay?

$I = prt$

$I = \$1000(.05)2$

$I = \$100$

ex. How much total will you pay back?

$1000 + 100 = \$1100$

ex. Jacket on sale at discount of 40% off. Original price was $80. Find sale price.

$0.40(80) = \$32$ $80 - 32 = \$48$

ex. Store pays $50 for shoes. marks them up 30%. What is the selling price?

$0.30(50) = \$15$ $50 + 15 = \$65$

Use the proportion (6-2) or the equation (6-3) to find the amount to + or -

- Discount (on sale): subtract that amount from original
- Markup: add that amount to the original

Subtract 100% minus the percent of discount to find the percent paid.

Use that ↑ in the equation or proportion to find the original price.

ex. Game is $30 on sale after a discount of 40%. Find the original price.

100% - 40% = 60% paid

$0.60 \cdot x = 30$

$\left(\frac{30}{x} = \frac{60}{100}\right)$ $x = \frac{30}{0.60} = \$50$