



East Allegheny



# Summer Packet

Name \_\_\_\_\_

Dear student PLEASE READ,

Please complete the following packet. This packet is a comprehensive review of all of the mathematics that will be necessary to be successful in math class next school year. This packet WILL be collected on the FIRST DAY OF SCHOOL and graded. There will be a test on the information within this packet within the first 5 days of school. This packet and the test will be worth 25% of your first 9-weeks grade.

Should you lose or misplace your packet over the summer months, you have two options of recovery. You may go to the high school office and ask for another copy of this packet, or you may go online to [eawildcats.net](http://eawildcats.net) and print out another copy for yourself directly from the EA website.

Take your time with this packet as it is very important to your grade at the beginning of next year. You might want to pace yourself with this packet and complete a few pages each week this summer to keep you from getting frustrated and burnt out. Remember, all concepts within the packet are those which you should already know. It is just a review to prepare you for the start of next year!

Good luck and have a wonderful summer break.

Mrs. DeMedio

Integrated Math teacher

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## PERCENT EQUATIONS

What is 40% of 8? $\downarrow \quad \downarrow \quad \downarrow$ $n = 0.4 \times 8$ $n = 3.2$	16 is 25% of what? $\downarrow \quad \downarrow \quad \downarrow$ $16 = 0.25 \times n$ $\frac{16}{0.25} = \frac{0.25n}{0.25}$ $0.4 = n$	What percent of 40 is 5? $\downarrow \quad \downarrow \quad \downarrow$ $n \quad \quad \quad \times 40 = 5$ $\frac{40n}{40} = \frac{5}{40}$ $n = 0.125$ $n = 12.5\%$
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In the equations above, what symbol represents each of these words?

a. is \_\_\_\_\_

b. of \_\_\_\_\_

c. what \_\_\_\_\_

**Write the equation for each statement and solve for n.**

What is 25% of \$80?

1% of what is 7?

5 is what percent of 10?

What percent of 27.7 is 1.8?

80% of 49 is what?

120% of what is 60?

9 is what percent of 200?

225% of 40 is what?

What is 55% of 600?

What percent of 150 is  $7\frac{1}{2}$ ?

5.4 is what percent of 9? 95% of what is 83.125

## SIMPLE INTEREST

Compound Interest is based on *simple interest*. Its formula is  $I = prt$ .

I is the interest

p is the principal

r is the interest rate per year (a percent)

t is the time in years

Example: Suppose you invested \$900 for two years. You earned \$67.50 in simple interest. What was the annual rate of interest?

$$\begin{aligned} I &= prt \\ 67.50 &= 900 \times r \times 2 \\ \frac{67.50}{1800} &= \frac{1800r}{1800} \\ r &= 0.0375 \text{ or } 3.75\% \end{aligned}$$

The annual rate of interest was 3.75

**Use the formula for simple interest,  $I = prt$ . Find each missing value.**

$$I = \underline{\hspace{2cm}}, \quad p = \$340, \quad r = 6\%, \quad t = 3 \text{ yr}$$

$$I = \$312.50, \quad p = \underline{\hspace{2cm}}, \quad r = 5\%, \quad t = 5 \text{ yr}$$

$$I = \$392, \quad p = \$1400, \quad r = \underline{\hspace{2cm}}, \quad t = 4 \text{ yr}$$

$$I = \$1540, \quad p = \$22,000, \quad r = 3.5\%, \quad t = \underline{\hspace{2cm}}$$

## PERCENT OF CHANGE

The percent of change is the percent an amount changed from its original amount. The amount of change is the difference between the 2 values.

$$\text{percent of change} = \frac{\text{amount of change}}{\text{original amount}}$$

When a value increases from its original amount, you call the percent of change the percent of increase.

When a value decreases from its original amount, you call the percent of change the percent of decrease.

Example: A store raises shirt prices from \$24 to \$27. Find the percent of increase.

$$\text{percent of change} = \frac{\text{amount of change}}{\text{original amount}}$$

$$\frac{3}{24} = .125$$

$$.125 \times 100 = \boxed{12.5\% \text{ increase}}$$

**Describe the percent of change as a percent of increase or decrease. Round to the nearest percent.**

\$12 to \$9

19 in. to 25 in.

180 lb to 150 lb

\$20,000 to \$25,000

Physical therapists measure strength on a dynamometer, which uses units called foot-pounds. Suppose you increase the strength in your elbow from 90 foot-pounds to 125 foot-pounds. Find the percent of increase.

In 1980, 419,007 people rode a motorcycle to work. The number of people riding a motorcycle to work in 1990 was 237,404. Find the percent of change.

a. Find the percent of change from 20 min to 25 min. \_\_\_\_\_

b. Find the percent of change from 25 min to 25 min. \_\_\_\_\_

c. Explain why the percent of change is different for parts a and b even though the amount of change is the same.

## PERCENTS

A percent is a ratio that compares a number with 100. A percent is another way to represent a fraction or a decimal

### Writing a percent as a decimal

a. 30%  $\rightarrow$  means 30 out of 100  $\frac{30}{100} = 0.30$ , or .3

b. 82%  $\rightarrow$  means 82 out of 100  $\frac{82}{100} = .82$

**Writing decimals and fractions as percents (any decimal can be changed to a percent by multiplying by  $\frac{100}{100}$  or by moving the decimal to places to the right)**

c. 0.823  $\rightarrow 0.823 \times \frac{100}{100} = \frac{82.3}{100} = 82.3\%$

**To change a fraction to a percent, divide the numerator by the denominator, then multiply the answer by 100 and include a percent sign.**

d.  $\frac{5}{8} \rightarrow 0.625 \times 100 = 62.5\%$

### Change each decimal to a percent

0.8      0.16      7.035      0.359      0.546      1.133      .1      .001

\_\_\_\_\_

### Change each fraction to a percent

$\frac{7}{8}$        $\frac{7}{12}$        $3\frac{9}{20}$        $\frac{1}{8}$        $\frac{125}{250}$        $\frac{2}{3}$        $2\frac{7}{10}$        $\frac{9}{12}$

\_\_\_\_\_



## SALES TAX

A sales tax is charged in nearly every state and by some cities in the United States. The tax rate for Allegheny County is 7%.

Example: Violet has decided to purchase a new lawn mower that sells for \$189.95. She lives in a state that charges 6.5% on all items. How much sales tax will she have to pay on the mower? What will be the full price of the mower with tax?

$$\begin{aligned}\text{Sales Tax} &= 6.5\% \times \text{price of mower} \\ &= .065 \times \$189.95 \\ &= \$12.35 \text{ (this is how much tax she will pay)}\end{aligned}$$

$$\begin{aligned}\text{Full price, including tax} &= \text{price of mower} + \text{sales tax} \\ &= \$189.95 + \$12.35 \\ &= \$202.30 \text{ (this is the total cost of the mower)}\end{aligned}$$

### Answer the following questions.

In his last visit to SunShine Flower Shop, Felix bought 1 philodendron @ \$2.99, 1 jade plant @ \$4.99, and 1 spider plant @ \$1.50. The sales tax in this state is 3%. What was the tax and total cost of Felix's purchase?

Barbera keeps track of her grocery purchases with a calculator. When she has finished buying, she notices that her total is \$25.15. At the rate of 5%, what sales tax will she have to add to this subtotal? What is the total cost of her groceries?

Paula's father has reminded her that it is time to paint the house. He sends her to the store with the following list of items to purchase. What will be the cost of these items, the sales tax, and the total bill? The sales tax in this state is 4.5%. She bought 3pkg of sandpaper @75¢; two 4" paint brushes @\$2.29; 10 gal. of purple house paint @ \$7.99; 2 gal. of green trim paint @ \$8.25.

Find the following total if the tax is 7%.

A trampoline at \$189.99

A watch at \$58.69

A dvd at \$14.88

A diamond ring at \$5,905.48

## ELAPSED TIME

Complete the table below.

Start Time	End Time	Elapsed Time
5:00 A.M.		3 hours and 57 minutes
8:00 P.M.	10:44 P.M.	
11:55 P.M.		23 minutes
1:35 P.M.		5 hours and 40 minutes
	4:16 A.M.	1 hour and 31 minutes
3:18 P.M.	7:09 P.M.	
	4:20 A.M.	2 hours
Noon	2:35 P.M.	
	8:10 P.M.	12 minutes

## ELAPSED TIME CONT...

Corina is making brownies. They need to bake for 47 minutes. She put them in the oven at 6:30 P.M. At what time should she take them out?

An airplane left the Newport News/Williamsburg Airport at 9:50 A.M. and arrived at Detroit, Michigan at 11:45 A.M. How long did the trip take?

Five hours and 42 minutes after he started a bike tour, Chen completed the tour. If he finished at 2:17 P.M., what time did he start?

A bus travels from town A to town B. It leaves town A at 9.30 a.m. Monday. The journey takes 26 h 20 min. When would the bus arrive in town B?

Susan spent 1 h 15 min washing her car and 1 h 50 min cleaning her house. How long did she take to complete both these tasks?

John took 1 h 35 min to drive from Town A to Town B. Jason started from Town A at the same time but arrived in Town B 38 min later. How long did it take Jason to drive from Town A to Town B?

Toni left at 6:45 A.M. to go surfing. She got home 7 hours and 26 minutes later. What time did she get home?

Jan clocks in and out every day she works at the candy factory. Today she clocked in at 7:52 a.m. and clocked out at 3:04 p.m. What was the total time she was at the candy factory?

## WAGES

The pay that some people get for their work is determined on an hourly rate. This kind of pay is known as a wage. Most people who work for wages are paid once a week, once every two weeks, or once a month. Their paycheck is determined by multiplying the number of hours they have worked times their hourly rate:

$$\text{Weekly pay (employee on wages)} = \text{Hourly rate} \times \text{Hours worked}$$

Sometimes, an employee is paid extra for working more than a set number of hours, that employee then receives additional pay for his or her work known as overtime pay.

Example: Sam Strong get's paid \$8.40 an hour. Any time after 35 hours he gets paid overtime at time and a half (1.5 times \$8.40). Sam worked 49 hours this week. What will his paycheck be if he gets paid weekly?

Regular Earnings	$\$8.40 \times 35$	= \$294.00
Overtime Earning	$(1.5 \times \$8.40) \times 14$	
	$\$12.60 \times 14$	= \$176.40

Total Earnings: \$470.40

Elizabeth Mills get's paid \$7.50 an hour. Any time after 40 hours of work she gets paid overtime at three times her normal hourly rate. Elizabeth worked 48 hours this week. What will her total earnings be if she gets paid weekly?

Charlie get's paid \$3.90 an hour. Any time after 40 hours he gets paid overtime at time and a half. Charlie worked 48 hours this week. What will his total earnings be if he gets paid weekly?

Julian get's paid an hourly rate of \$8.45. After 40 hours of work per week he get's paid double time. Julian worked 43 hours last week and 45 hours this week. What will his total earnings be if he get's paid once every two weeks?

## WAGES CONT...

Rick get's paid an hourly rate of \$11.88. After 42 hours of work per week he get's paid double time. Rick worked 42 hours last week and 48 hours this week. What will his total earnings be if he get's paid once every two weeks?

Ann get's paid an hourly rate of \$5.50. After 30 hours of work per week she get's paid double time. Ann worked 33.5 hours last week and 30.25 hours this week. What will her total earnings be if she get's paid once every two weeks?

Bonnie get's paid an hourly rate of \$7.36. After 25 hours of work per week she get's paid time and a half. Bonnie worked 29.25 hours this week. What will her total earnings be if she get's paid every week?

Clark get's paid an hourly rate of \$15.67. After 40 hours of work per week he get's double time. Clark get's paid monthly. Here are his hours for the month of May.

Week 1: 48 hours worked

Week 2: 41.5 hours worked

Week 3: 40 hours worked

Week 4: 50.25 hours worked

What will his total earning be for the month of May?

## **COMMISSION**

One way that people earn money is by commission. A commission is a percentage of sales or profit of items or services being sold, or a fixed amount per sale. For example, a person selling books may earn 10% of every book sold. If \$1000 of books are sold, then \$100 in commissions are earned. Types of jobs that often include a commission include car sales, real estate, etc. Commissions are used as a way for companies to motivate employees.

### **Straight commission**

With a straight commission, the individual only receives a percentage of the sales made. No additional compensation is given or guaranteed.

### **Base plus commission**

Often, besides the percentage of sale or profit, one working for commission may receive additional compensation. This salary may include 'base', or base plus commission. For example, a book sales person may earn a \$1000 base plus 10% of every book sold.

### **Draw against commission**

Another commission compensation method includes a draw, or draw against commission. With a draw, the company will guarantee a certain amount of pay. If the salesperson's commission is below that amount, then they will receive the draw amount. The salesperson is expected to pay back the difference between the commission earned and the amount received from the draw.

### **Answer the problems below:**

Jaden works selling books. Along with earning a 3% commission on all sales made, there is a guaranteed draw of \$14.00. How much should Jaden earn if \$614.00 of books are sold?

Ryan has a job selling event tickets, and earns a base salary of \$295.00 plus a 8% commission on all sales made. How much in total should Ryan earn if \$638.00 of event tickets are sold?

Christopher has a job selling books, and earns a 2% commission on all sales made. How much in commissions should Christopher earn if \$280.00 of books are sold?

### **COMMISSION CONT...**

Jordan has a job selling cd's, and earns a 8% commission on all sales made. How much does Jordan need to sell to get \$31.76 in commissions?

Bailey has a job selling cleaning supplies, and earns a 5% commission on all sales made. The commission increases to 10% for all sales over \$300.00. How much in commissions should Bailey earn if \$470.00 of cleaning supplies are sold?

Grace has a job selling cleaning supplies, and earns a base salary of \$403.00 plus a 7% commission on all sales made. How much in total should Grace earn if \$129.00 of cleaning supplies are sold?

Hunter has a job selling event tickets, and earns a 6% commission on all sales made. The commission increases to 10% for all sales over \$100.00. How much in commissions should Hunter earn if \$166.00 of event tickets are sold?

Christopher works selling magazines. Along with earning a 5% commission on all sales made, there is a guaranteed draw of \$12.00. How much should Christopher earn if \$174.00 of magazines are sold?

Jaden has a job selling books, and earns a 2% commission on all sales made. How much does Jaden need to sell to get \$10.36 in commissions?

## WEEKLY AND YEARLY PAY

Figuring the weekly and yearly pay for a job when the hourly rate and hours of work per week are known.

Example:    Job: Gardener  
                  \$14.95/hour, 40 hours/week

WEEKLY:    \$14.95 x 40 = \$598.00 / week

YEARLY: (weekly pay x 52 weeks in a year)  
                  \$598.00 x 52 = \$31096.00 / year

Job: Auto Mechanic  
\$27.74/hour, 36 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Computer Operator  
\$18.45/hour, 20 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Dental Assistant  
\$14.03/hour, 32 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Dog Groomer  
\$10.88/hour, 15 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Photo lab technician  
\$8.32/hour, 28 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Accounting Clerk  
\$13.98/hour, 16 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Secretary  
\$13.44/hour, 25 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Security Guard  
\$10.57/hour, 40 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Gas Station attendant  
\$8.47/hour, 27 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year

Job: Short Order Cook  
\$9.06/hour, 40 hours/week

\$ \_\_\_\_\_/week

\$ \_\_\_\_\_/year