

Math 7 Study Guide
Chapter 2 Percent

Name _____
Block _____

Key
Date _____

TEST on chapter 2 will be on Thursday, February 20
You will use a calculator on this test.

Study Guide Practice Questions are due BEFORE the Test on **2/20/2020**
Questions must be complete, work clearly shown, correct, and errors or incomplete work fixed.

You should be able to solve percent application problems including

- *percent change
- *percent error
- *sales tax, tips, markups
- *discount and sale prices
- *simple interest
- *estimation

You should be comfortable converting back and forth between decimals, percents, and fractions.

You should be able to solve problems like 16 is what percent of 10 OR 2 is 7% of what # ?

You should be able to set up a percent proportion to solve a problem. This includes defining the variable in a word ratio.

You should be able to test a claim about a percent and use mathematics to prove it correct or incorrect.

Math 7- Practice Questions
(for Chapter 2 Test: Percents)

Name Key
Block _____ Date _____

*You may use a calculator. Show steps! Round money to the nearest cent. Otherwise give exact answers. Round to the nearest tenth only if necessary.

<p>1) Jared plans to leave a 15% tip for a meal that cost him \$12.69. How much should the tip be to be exactly 15%?</p> <p>15% of 12.69 $.15(12.69) = 1.9035$ $\\$1.90$</p> <p>or</p> $\frac{\text{tip}}{\text{bill}} = \frac{15}{100} = \frac{n}{12.69}$	<p>2) How much will you <u>save</u> on a \$48.79 pair of shoes if they are marked 10% off?</p> <p>10% of 48.79 $.10(48.79) = 4.879$ $= \\$4.88 \text{ off}$</p> <p>or</p> $\frac{\text{save } (\$ \text{ off})}{\text{Reg}} = \frac{10}{100} = \frac{n}{48.79}$	<p>3) How much simple interest will you earn in an account that earns 1.5% interest if you deposit \$400 and leave it there 5 years?</p> <p>$i = Prt$ $i = 400(.015)(5)$ $i = 30$ $\\$30$</p>
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<p>4) Sam is planning to buy three binders that each cost \$5.99. He has a 30% off coupon. Explain clearly how you could ESTIMATE the cost of the three binders on sale.</p>	<p>$3(6.00) = 18.00$ Reg price.</p> <p>30% of 18 $10\% \times 3$ 1.80×3 \downarrow $\approx 2.00 \times 3$ $\\$6 \text{ off}$</p> <div style="text-align: right;"> $\begin{array}{r} 18 \\ - 6 \\ \hline \\$12 \end{array}$ </div>	<p>There are other ways too.</p>
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5) Zach earned \$160 shoveling snow last month. Jon earned 20% more than Zach. How much did Jon earn?

$$20\% \text{ of } 160 = .2(160) = \$32 \text{ more money}$$

$$\begin{array}{r} 160 \\ + 32 \\ \hline \$192 \end{array} \text{ Jon earns}$$

or

$$\frac{\text{Jon's } \$}{\text{Zach's } \$} = \frac{120}{100} = \frac{n}{160}$$

6) 3.5% of the 400 students at Westmont Middle School have red hair. How many students have red hair?

$$3.5\% \text{ of } 400 = .035(400) = 14 \text{ students red hair}$$

7) Jack received a 12% increase on his hourly wage of \$9.80. What is his new hourly wage?

$$12\% \text{ of } 9.80 = \text{increase} \\ .12(9.80) = 1.176 \\ = \$1.18 \text{ increase}$$

$$\begin{array}{r} 9.80 \\ + 1.18 \\ \hline \$10.98 \end{array}$$

8) 24 is 0.25% of what number?

$$\frac{.25}{100} = \frac{24}{n}$$

$$n = 9600$$

9) Which of these are equivalent to

$$\frac{8}{10} ?$$

0.8%

$$\frac{0.8}{10}$$

$$\frac{80\%}{100} = \frac{8}{10}$$

$$\frac{8\%}{100}$$

$$\frac{0.08\%}{100}$$

$$\frac{80}{1000} = \frac{8}{100}$$

$$\frac{80}{100}$$

8.10

$$0.18 \frac{18}{100}$$

10) Jen buys a bag of chips for \$2.89 and a bottle of soda for \$1.19. How much will it cost her including 6.35% sales tax?

$$\begin{array}{r} 2.89 \\ + 1.19 \\ \hline \$4.08 + \text{tax} \end{array}$$

$$.0635(4.08) = .25908 \\ = \$0.26 \text{ tax}$$

$$\begin{array}{r} 4.08 \\ + .26 \\ \hline \$4.34 \end{array}$$

11) Claude thinks 0.2% is equivalent to 0.2
 Claudette thinks 0.2% is equivalent to 0.002.
 Claudio thinks 0.2% is equivalent to 0.2
 Who is correct? Explain your thinking using mathematics. Claudette

$$.2\% = \frac{.2 \times 10}{100 \times 10} = \frac{2}{1000} = .002$$

or

.2% → decimal
 Move decimal point 2 places left

2 → .002

12) Last year at Mario's Pizza restaurant a large cheese pizza cost \$8.99. It now costs \$10.50. Find the percent increase to the nearest tenth of a percent.

$$\frac{\text{increase}}{\text{original (last year)}} \cdot \frac{n}{100} = \frac{1.51}{8.99}$$

$$n = 16.79644$$

$$\begin{array}{r} 10.50 \\ - 8.99 \\ \hline 1.51 \end{array}$$

≈ 16.8% increase

13) There are 782 pennies in a jar. Sara estimates that there are 850 pennies. Find her percent error. Round to the nearest tenth of a percent.

$$\frac{\text{amount of error}}{\text{actual amount}} \cdot \frac{n}{100} = \frac{68}{782}$$

$$n = 8.6956$$

≈ 8.7% error

$$\begin{array}{r} 850 \\ - 782 \\ \hline 68 \end{array}$$

14) Five years ago sales tax in Connecticut was 6%. Now it is 6.35%. Find the percent increase to the nearest tenth of a percent.

$$\frac{\text{increase}}{\text{original}} \cdot \frac{n}{100} = \frac{.35}{6}$$

$$n = 5.8333$$

$$\begin{array}{r} 6.35 \\ - 6 \\ \hline .35 \end{array}$$

≈ 5.8% increase

15) A survey at LMS showed the following preferences for students' favorite flavor of ice cream.

Vanilla 24
 Chocolate 60
 Strawberry 12
 Cookies'n Cream 96
 Rocky Road 288

 Total 480

A) What percent of the students prefer cookies'n cream?

$$\frac{\text{cookies' n cream}}{\text{all}} = \frac{n}{100} = \frac{96}{480}$$

20%

B) What percent of the students prefer vanilla or chocolate?

$$\frac{\text{vanilla + choc}}{\text{all}} = \frac{n}{100} = \frac{84}{480}$$

$$n = 17.5$$

17.5%

V. 24
 C. 60

 84

16) Using the data from question #15, is the following statement true or false? Explain your reasoning.

A) 50% of the students chose either strawberry or rocky road.

$$\frac{\text{strawb or RR}}{\text{all}} = \frac{12 + 288}{480} = \frac{n}{100}$$

$$\frac{300}{480} = \frac{n}{100}$$

False It is 62.5% not 50%.

B) 12% more of the students chose vanilla than strawberry.

$$\frac{\text{vanilla}}{\text{all}} = \frac{24}{480} = \frac{n}{100} \quad 5\%$$

$$\frac{\text{strawberry}}{\text{all}} = \frac{12}{480} = \frac{n}{100} \quad 2.5\%$$

$$\frac{5}{2.5} = 2$$

False Only 2.5% more chose vanilla than strawberry.

2 years

17) Sara earned \$360 interest over 24 months in an account that earned 4.5% yearly interest. How much money did she have in the account at the beginning of this time?

$$i = prt$$

$$360 = P(0.045)(2)$$

$$360 = .09P$$

$$\frac{360}{.09} = \frac{.09P}{.09}$$

$$\text{\$4000} = P$$

18) Marianne bought a \$49 backpack when it was on sale for 30% off. If she must pay 4% sales tax, what is her final cost?

$$30\% \text{ of } 49 = \text{discount}$$

$$.3(49) = 14.70 \text{ off}$$

$$\begin{array}{r} 49 \\ - 14.70 \\ \hline \text{\$}34.30 \text{ sale price} \end{array}$$

$$\text{tax is } 4\% \text{ of } 34.30$$

$$.04(34.30)$$

$$1.372$$

$$1.37 \text{ tax}$$

$$\begin{array}{r} 34.30 \\ + 1.37 \text{ tax} \\ \hline \text{\$}35.67 \text{ final price} \end{array}$$

19) Josh wants to buy a new video game.

*Which store has the best price? B

*How much cheaper is it? \\$0.47

Store A
 \$24.99
 30% off
 5.5% tax

$$.30(24.99) = 7.497$$

$$= 7.50 \text{ off}$$

$$\begin{array}{r} 24.99 \\ - 7.50 \\ \hline 17.49 \text{ sale price} \end{array}$$

$$.055(17.49) = \text{tax}$$

$$.96195 \approx \text{\$}0.96 \text{ tax}$$

$$\begin{array}{r} 17.49 \\ + 0.96 \\ \hline \text{\$}18.45 \end{array}$$

$$\begin{array}{r} 18.45 \\ - 17.98 \\ \hline \text{\$}0.47 \end{array}$$

Store B
 \$19.89
 15% off
 6.35% tax

$$.15(19.89) = 2.9835$$

$$= 2.98 \text{ off}$$

$$\begin{array}{r} 19.89 \\ - 2.98 \\ \hline 16.91 \text{ sale price} \end{array}$$

$$.0635(16.91) = \text{tax}$$

$$1.073785$$

$$\text{\$}1.07 \text{ tax}$$

$$\begin{array}{r} 16.91 \\ + 1.07 \\ \hline \text{\$}17.98 \end{array}$$

20) At the restaurant Molly paid 0.45 of the bill, Kara paid 15% of the bill, Sue paid $\frac{1}{8}$ of the bill. Dana will pay the rest.

A) Dana thinks she will pay $\frac{1}{4}$ of the bill. Is she correct? No Why or why not? Explain clearly.

$$\begin{array}{l} M \quad .45 = 45\% \\ K \quad = 15\% \\ S \quad \frac{1}{8} = 12.5\% \end{array} \left. \vphantom{\begin{array}{l} M \\ K \\ S \end{array}} \right\} 72.5\%$$

Dana $100\% - 72.5\% = 27.5\%$

Since $\frac{1}{4}$ is 25% it would not equal 100%

$$\begin{array}{r} 72.5 \\ + 27.5 \\ \hline 100 \end{array}$$

B) If the bill is \$80, how much will they each pay?

$$\begin{array}{l} \textcircled{M} \quad .45(80) = \$36 \\ \textcircled{K} \quad .15(80) = \$12 \\ \textcircled{S} \quad .125(80) = \$10 \\ \textcircled{D} \quad .275(80) = \$22 \end{array}$$

21) Find the percent discount on an item that regularly costs \$345 if it is marked down to \$292. Round to the nearest whole number percent.

$$\begin{array}{r} 345 \\ - 292 \\ \hline 53 \end{array}$$

$$\frac{\text{amount of discount}}{\text{Reg price}}$$

$$\frac{n}{100} = \frac{53}{345}$$

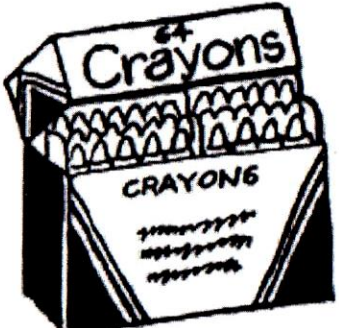
$$n = 15.3623$$

$$\approx \textcircled{15\% \text{ discount}}$$

22) Is this ad correct? Show the mathematics you use to prove your answer in the chart below.

Save 45% off our regular price!

CRAYO CRAYONS
 64 count per box
\$1.49
 Our Regular \$2.59



Steps (Arithmetic)

Reasons (What Computation Tells You)

$$\frac{\text{off}}{\text{Reg}} = \frac{n}{100} = \frac{1.10}{2.59}$$

$$n = 42.471 \approx 42\% \text{ off}$$

$$\begin{array}{r} 2.59 \\ -1.49 \\ \hline 1.10 \text{ off} \end{array}$$

Find % off

Find dollars off

No ad is not correct
 We only save 42%

OR

45% of 2.59

$$.45(2.59) = 1.1655$$

\$ 1.17 off

$$\begin{array}{r} 2.59 \\ -1.17 \\ \hline 1.42 \end{array}$$

Find what 45% off is

Find \$ off

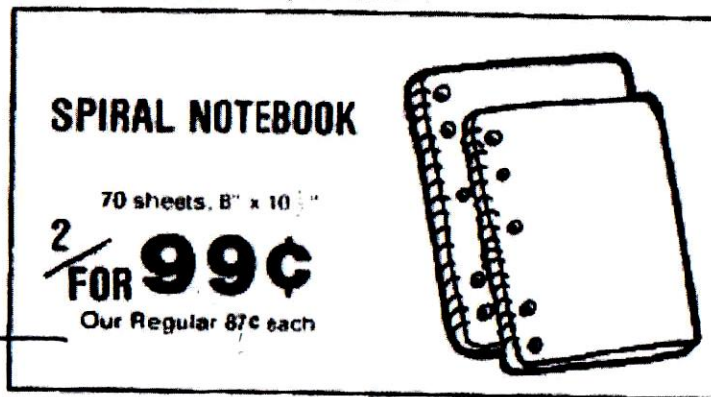
Find sale price

No ad is not correct
 Sale price needs to

be 1.42 It's only \$1.49

23) Is This Ad Correct? Show the mathematics you use to prove your answer in the chart below.

40% or more
At least 40% off!



2/1.74 ←

Steps (Arithmetic)

Reasons (What Computation Tells You)

$$2(.87) = 1.74 \text{ Reg}$$

Find Reg cost of 2 notebooks

$$\frac{\text{off}}{\text{Reg}} = \frac{n}{100} = \frac{.75}{1.74}$$

Find % off

$$n = 43.103$$

≈ 43% off

$$\begin{array}{r} 1.74 \\ - .99 \\ \hline .75 \end{array}$$

Find dollars off

Ad is correct

It is actually 43% off

$$2(.87) = 1.74 \text{ Reg}$$

Reg Price of 2

$$\frac{\text{sale}}{\text{Reg}} = \frac{60}{100} = \frac{n}{1.74}$$

$$n = 1.04$$

find 40% off — pay 60%

Exactly 40% off ⇒ \$1.04

and since it's \$.99 Ad is correct

2) (% Applications (Defend Headlines Claim))

The headlines in a local paper say, "More than 40% of LMS students are involved in the music program. Does the data support the claim? Yes Explain your reasoning.

<u>LMS Music Program</u>	
	<u># of Students</u>
Band only	80
Chorus only	70
Both band & chorus	50
No band or chorus	250

Steps (Arithmetic)

$$80 + 70 + 50 = 200$$

$$200 + 250 = 450$$

$$\frac{200}{450} = \frac{n}{100}$$

$$n = 44.444$$

$$\approx 44\% \text{ music.}$$

Reasons (What Computation Tells You)

Total in music program

Total in LMS

$$\% \text{ music} = \frac{\# \text{ music}}{\text{total}} = \frac{n}{100}$$

Headline is correct

44% of LMS students are involved in the music program which is more than 40%

25) Sam invested \$4000 for 2 years. He earned \$800 in simple interest. Find the interest rate. Remember to write the formula and show all steps as discussed in class.

$$i = Prt$$
$$800 = 4000r(2)$$

$$800 = 8000r$$

$$\frac{800}{8000} = \frac{8000r}{8000}$$

$$0.1 = r$$

10%

26) Tina took out a loan for \$12,000 for 48 months. She had to pay 6% simple interest rate. How much interest did she have to pay? Remember to write the formula and show all steps as discussed in class.

$$i = Prt$$

$$48 \text{ months} = 4 \text{ years}$$

$$i = 12000(.06)(4)$$

$$i = 2880$$

\$2880

27) What number is 0.5% of 800?

$$\frac{.5}{100} = \frac{n}{800}$$

$$n = 4$$

28) 44 is 12.5% of what number?

$$\frac{12.5}{100} = \frac{44}{n}$$

$$n = 352$$