

# Reading to Learn Mathematics

## Vocabulary Builder

# Chapter 6

This is an alphabetical list of the key vocabulary terms you will learn in Chapter 6. As you study the chapter, complete each term's definition or description. Remember to add the page number where you found the term.

Vocabulary Term	Found on Page	Definition/Description/Example
6.5 amount due	p. 281	Principal + accumulated interest
6.6 commission		amount of money someone earns that is a % of their total sales
6.6 commission rate	% (ex)	the percent of the commission on 2% commission to sell houses
6.3 discount	$\frac{\% \text{ discount}}{100} = \frac{\text{discount}}{\text{reg price}}$	\$ OFF the item ← Regular
6.6 graduated commission		rate of commission increases as the sales increase. 3% for the 1st \$10,000, 4% next \$6000
6.4 income tax	p. 274	taxes paid by employed people in the U.S. based on the income
6.4 net pay	p. 274	take-home pay
6.4 gross pay	p. 274	total amount without deductions
percent per 100 items	p. 260	out of 100 $\left[ \frac{\text{part}}{\text{whole}} = \frac{\%}{100} \right]$
6.7 percent of decrease	p. 290	tells what % the amount of decrease is from the original-#

$$\frac{\text{IS}}{\text{OF}} = \frac{\%}{100}$$

(continued on the next page)

## Reading to Learn Mathematics

## Vocabulary Builder (continued)

Vocabulary Term	Found on Page	Definition/Description/Example
percent of increase	p. 290	tells what % the amount of increase is from the original #
principal. =		Amount invested or P borrowed
property tax 200% → 2.00	p. 274	tax based on the value of your land, home + real estate.
rate = 6% → .06 30% → .30	R	interest rate - always change the % to a decimal
sale price	p. 270	Reg. price - discount
sales tax	p. 274	tax added onto a price of most items - not including food
simple interest		$I = P \cdot R \cdot T$ Find the interest once per year
tax	p. 274	a charge, usually a percentage that is imposed by an authority (gov., local, state or federal)
time =		T in the interest formula must be in years

$$3 \text{ mo} = \frac{1}{4} \text{ yr} = .25 \text{ yrs}$$

$$4 \text{ mo} = \frac{4}{12} = \frac{1}{3} \text{ yr or } .33$$

$$18 \text{ mo} = 1.5 \text{ yrs}$$

6.1

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

Find the percent of each number, using a proportion.

1. 40% of 700  $\frac{X}{700} = \frac{40}{100}$  280      2. 25% of 4800 \_\_\_\_\_
3. 55% of 165  $\frac{X}{165} = \frac{55}{100}$  90.75
4. 50% of 492 \_\_\_\_\_      5. 11% of 300  $\frac{X}{300} = \frac{11}{100}$  33
6.  $12\frac{1}{2}\%$  of 72 \_\_\_\_\_
7. 7.5% of 2000  $\frac{X}{2000} = \frac{7.5}{100}$  150      8.  $12\frac{1}{2}\%$  of 64 \_\_\_\_\_
9. 0.4% of 20  $\frac{X}{20} = \frac{0.4}{100}$  .08

Write and solve a proportion.

10. What percent of 80 is 4? \_\_\_\_\_
11. What percent of 56 is 7?  $\frac{7}{56} = \frac{X}{100}$  12.5%
12. What percent of 60 is 15? \_\_\_\_\_
13. What percent of 100 is 5?  $\frac{X}{100} = \frac{5}{100}$  5%
14. 36 is what percent of 144? \_\_\_\_\_
15. 9 is what percent of 3?  $\frac{9}{3} = \frac{X}{100}$  300%
16. 45% of what number is 135? \_\_\_\_\_
17. 33 is 75% of what number?  $\frac{33}{X} = \frac{75}{100}$  44

$$\frac{\% \text{ discount}}{100} = \frac{\text{discount}}{\text{reg price}}$$

6.23

Find the discount and the sale price. Round your answers to the nearest cent.

1. Regular price: \$225.75      Percent of discount: 30%       $\frac{30}{100} = \frac{d}{225.75}$        $d = 67.73$        $\text{sale} = 225.75 - 67.73$
2. Regular price: \$42.78      Percent of discount: 4%       $\frac{4}{100} = \frac{d}{42.78}$        $d = 1.71$        $\text{Sale} = 42.78 - 1.71 = 41.07$
3. Regular price: \$25.60      Percent of discount: 25%       $\frac{25}{100} = \frac{d}{25.60}$        $d = 6.40$        $\text{Sale} = 25.60 - 6.40 = 19.20$
4. Regular price: \$6000      Percent of discount: 8.5%       $\frac{8.5}{100} = \frac{d}{6000}$        $d = 510$        $\text{SP} = 6000 - 510 = 5490$
5. Regular price: \$340      Percent of discount: 20%       $\frac{20}{100} = \frac{d}{340}$        $d = 68$        $\text{sale} = 340 - 68 = 272$
6. Regular price: \$459.99      Percent of discount: 40%       $\frac{40}{100} = \frac{d}{459.99}$        $d = 183.996$        $\text{sp.} = 459.99 - 184 = 275.99$
7. Regular price: \$65.40      Percent of discount: 5%       $\frac{5}{100} = \frac{d}{65.40}$        $d = 3.27$        $\text{Sale} = 65.40 - 3.27 = 62.13$
8. Regular price: \$36.37      Percent of discount: 1%       $\frac{1}{100} = \frac{d}{36.37}$        $d = 0.3637$        $\text{sp.} = 36.37 - 0.36 = 36.01$

$$\frac{5}{100} = \frac{d}{65.40}$$

$$d = \$3.27$$

$$\text{Sale} = 65.40 - 3.27$$

$$\$62.13$$

$$\frac{1\%}{100} = \frac{d}{36.37}$$

$$d = .3637$$

$$d = .36$$



# 6.4 $\frac{\text{tax}}{\text{item cost}} = \frac{\%}{100}$ [Part 1]

Find the amount of the sales tax and total cost of each item.

$$\frac{x}{40} = \frac{8}{100}$$

1. Video: \$15

Sales tax rate: 5%

Amount of sales tax:

Total cost of video:

$$15 + 1.75$$

3. Book: \$25

Sales tax rate: 7%

Amount of sales tax:

Total cost of book:

5. Software: \$35

Sales tax rate: 9%

Amount of sales tax:

Total cost of software:

$$\frac{x}{15} = \frac{5}{100}$$

$$x = \$0.75 \text{ or } 75¢$$

$$\underline{\$15.75}$$

$$\frac{x}{25} = \frac{7}{100}$$

$$x = \$1.75$$

$$\underline{\$26.75}$$

$$\frac{x}{35} = \frac{9}{100}$$

$$x = \$3.15$$

$$\underline{\$38.15}$$

2. Sweater: \$40

Sales tax rate: 8%

Amount of sales tax:

Total cost of sweater:

$$\frac{x}{40} = \frac{8}{100}$$

$$x = \$3.20$$

$$\underline{\$43.20}$$

4. Calculator: \$88

Sales tax rate: 6%

Amount of sales tax:

Total cost of calculator:

$$\frac{x}{88} = \frac{6}{100}$$

$$x = \$5.28$$

$$\underline{\$93.28}$$

$$88 + 5.28$$

6. CD: \$18

Sales tax rate: 5.5%

Amount of sales tax:

Total cost of CD:

$$\frac{x}{18} = \frac{5.5}{100}$$

$$x = \$0.99$$

$$\underline{\$18.99}$$

**Total Amount = Principal + Interest**

**Interest = Principal · Rate · Time (in years)**

## 6.5

$$I = P \cdot R \cdot T$$

\* must convert rate (%) to a decimal

Find the interest and the total amount.

Principal	Rate	Time	Interest	Total Amount
1. \$640	5% (0.05)	6 mo (1/2)	\$16	\$656
2. \$3000	4% (0.04)	2 yr	\$240	\$3000 + \$240 = \$3240
3. \$475	11% (0.11)	3 yr	\$156.75	475 + 156.75 = \$631.75
4. \$700	7.5% (0.075)	2 yr	\$105	700 + 105 = \$805
5. \$58.50	5 1/4% = 5.25% (0.0525)	2 1/2 yr	\$7.68	58.50 + 7.68 = \$66.18
6. \$200	9.5% (0.095)	3 mo ÷ 12 = 0.25 yr	\$4.75	200 + 4.75 = \$204.75
7. \$860	12% (0.12)	4 mo ÷ 12 = 1/3 yr	\$34.40	860 + 34.40 = \$894.40
8. \$138	18%	2 mo		
9. \$620	6.65% = 0.0665	2 yr		

10. Find the Interest Rate.

P = \$2000    R = 5.5%    T = 36 mo = 3 yr

I = \$330

$$330 = 2000(R)(3)$$

$$330 = 6000R$$

$$\frac{330}{6000} = \frac{6000R}{6000}$$

$$0.055 = R \quad (R = 5.5\%)$$

11.

P = \$5000    R = 5%    T = 4 yr

I = \$1000

$$1000 = 5000 \cdot R \cdot 4$$

$$\frac{1000}{20000} = \frac{20000R}{20000}$$

$$0.05 = R$$

$$6.6 \quad \frac{C}{600} = \frac{5}{100}$$

$$\frac{C}{800} = \frac{2}{100}$$

Find the commission and the total income.

1. Base salary: \$350/wk

Total sales: \$600/wk

Commission rate: 5%

Commission:  $C$

Total income:  $350 + 30 = \$380$

2. Base salary: \$600/mo

Total sales: \$800/mo

Sales tax rate: 2%

Commission:  $C = \$16$

Total income:  $\text{Base} + C = 600 + 16 = \$616$

3. Base salary: \$400/wk

Total sales: \$1000/wk

Commission rate: 4%

Commission:  $C$

Total income:  $400 + 40 = \$440$

4. Base salary: \$900/mo

Total sales: \$1500/mo

Sales tax rate: 8%

Commission:  $C = \$120$

Total income:  $900 + 120 = \$1020$

5. Base salary: \$550/mo

Total sales: \$450/mo

Commission rate: 5%

Commission:  $C = \$22.50$

Total income:

Base Salary + Comm  
 $550 + 22.50 =$   
 $\$572.50$

6. Base salary: \$25,000/yr

Total sales: \$50,000/yr

Sales tax rate: 10%

Commission:  $C = \$5000$

Total income:

$\frac{C}{50000} = \frac{10}{100}$   
 $C = \$5000$   
 $C = \$30,000$   
 $25000 + 5000$   
 Base Comm

6.7

Find the percent of increase. Round to the nearest tenth.

1. Original price: \$300  
 New price: \$360  
 $\frac{(360 - 300)}{300} \cdot 100$   
 20% increase

2. Original weight: 120 lb  
 New weight: 140 lb  
 $\frac{(140 - 120)}{120} \cdot 100$   
 16.7% ↑

3. Original rent: \$500  
 New rent: \$575  
 $\frac{(575 - 500)}{500} \cdot 100$   
 15% ↑

4. Original number: 4500  
 New number: 4590  
 $\frac{(4590 - 4500)}{4500} \cdot 100$   
 2% ↑

Find the percent of decrease. Round to the nearest tenth.

5. Original price: \$50  
 New price: \$35  
 $\frac{(50 - 35)}{50} \cdot 100$   
 30% ↓

6. Original number: 400  
 New number: 352  
 $\frac{(400 - 352)}{400} \cdot 100$   
 12% ↓

7. Original salary: \$60  
 New salary: \$45  
 $\frac{(60 - 45)}{60} \cdot 100$   
 25% ↓

8. Original size: 80 cm  
 New size: 48 cm  
 $\frac{(80 - 48)}{80} \cdot 100$   
 40% ↓

$\% \uparrow \text{ or } \downarrow = \frac{(\text{Big} - \text{Small})}{\text{original}} \cdot 100$

# Percents

6.1 put it over  
 $100 \quad 3\% = \frac{3}{100}$

6.1 move the decimal point 2 places left

6.1 is =  $\frac{\%}{100}$

6.5  $I = P \cdot R \cdot T$   
 P = Principal amount deposited or borrowed or invested  
 R = Rate %  $\rightarrow$  decimal  
 T = time in years

6.11 out of 100

definition

6.6 Commission

commission  
 $\frac{\text{money earned}}{\text{total sales}} = \frac{\text{commission rate \%}}{100}$

Total income = commission + base salary

6.3 discounts  
 discount much money (how you save)

$\frac{d}{\text{reg. price}} = \frac{\% \text{ discount}}{100}$

Sale price =  $\text{reg. price} - \text{discount}$

decimal proportion

to find tax

6.4  $\frac{\text{sales tax}}{\text{item cost}} = \frac{\% \text{ (sales tax)}}{100}$

Total = sales tax + item cost

6.7 % of increase and % decrease

$\left( \frac{\text{difference (big - small)}}{\text{original}} \right) \cdot 100 =$

% of increase or decrease



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

textbook  
p. 262

$$\frac{15}{100} = \frac{\%}{100}$$

63% of 215 is what#?

$$\frac{63}{215} = \frac{X}{100}$$

$$X = 135.45$$

23 what % of 56 is 8.4?

$$\frac{8.4}{56} = \frac{X}{100}$$

$$X = 15$$

$$\frac{12}{X} = \frac{5}{100}$$

$$X = 240$$

$$\frac{100}{X} = \frac{45}{100}$$

$$X = 133\frac{1}{3}$$

$$\frac{3}{X} = \frac{2}{100}$$

$$X = 150$$

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

$$\frac{71}{80} = \frac{X}{100}$$

Percent  $\xrightarrow{\div 100}$  Decimal  $\leftarrow$  Fraction

TOP  $\div$  Bottom

52%	$\times \frac{100}{100}$	0.52	$\frac{52}{100} = \frac{13}{25}$ <small>reduce</small>
12%		0.12	$\frac{12}{100} = \frac{3}{25}$
15%		$3 \div 20 = 0.15$	$\frac{3}{20}$
25%		0.25	$\frac{25}{100} = \frac{1}{4}$
75%		0.75	$\frac{75}{100} = \frac{3}{4}$
50%		0.50	$\frac{1}{2}$
6%		0.06	$\frac{6}{100} = \frac{3}{50}$
40%		$2 \div 5 = 0.40$	$\frac{2}{5}$
36.5%		0.365	$\frac{365}{1000} = \frac{73}{200}$
120%		0.120	$\frac{120}{1000} = \frac{3}{25}$





Find the % of the discount.

reg. price: \$115.18

sale price: \$111.72

$$\frac{\text{discount}}{\text{reg price}} = \frac{\%}{100}$$

$$d = \text{reg price} - \text{sale price}$$

$$d = 115.18 - 111.72$$

$$d = \$3.46$$

$$\begin{array}{r} 4 \\ 115.18 \\ - 111.72 \\ \hline 3.46 \end{array}$$

$$\frac{3.46}{115.18} = \frac{x}{100}$$

$$x = 3\%$$

Find the % of the discount.

reg price \$3880.00

sale price \$3395

$$d = 485$$

$$\frac{x}{100} = \frac{485}{3880}$$

$$x = 12.5\%$$

Find the % of the discount

①

reg. price \$369.99  
-  
sale price \$295.99

$$\frac{x}{100} = \frac{74.}{369.99}$$

$$x = 20\%$$

②

reg price: \$415.38  
% of discount: 15%

Find the discount + the sale price.

= reg p. - discount

$$\frac{d}{415.38} = \frac{15}{100}$$

$$d = \$62.31$$

\$415.38  
- 62.31

\$353.07

# 6.4 Part 2

## Income Tax, Net Pay + Property Tax

Example:

- ① Find the amount of the sales tax and total cost of each item.

Price: \$125.49

Sales Tax Rate: 6%

$$\frac{x}{125.49} = \frac{6\%}{100}$$

Sales tax:  $x = \$7.53$

total cost = \$125.49 + \$7.53

**T. Cost = \$133.02**

p. 278 (28-33)

- ② Find the sales tax rate (%) to the nearest tenth of a percent.

Price: \$210.20

Total Cost: \$225.44

1st: Find out how much sales tax was added

(total cost - price)

$$\begin{array}{r} 225.44 \\ - 210.20 \\ \hline \$15.24 \end{array}$$

$$\frac{\text{tax}}{\text{item cost}} = \frac{\text{sales tax rate}}{100}$$

$$\frac{15.24}{210.20} = \frac{x}{100}$$

$x \approx 7.250$

**$x \approx 7.3\%$**

like #18 wkst

## income tax + net pay

(ex) salary: \$950/wks  
25% income taxes

calculate the amount of income tax  
and the net pay.

$$\frac{\text{income tax}}{\text{Salary}} = \frac{\% \text{ income tax}}{100}$$

income

$$\frac{x}{950} = \frac{25}{100}$$

$$\text{income tax } \% x = 237.50$$

$$\text{Net Pay} = \text{Salary} - \text{Income Tax}$$

$$\text{Net Pay} = 950 - 237.50$$

$$\text{Net Pay} = \$712.50$$

(ex) Property Tax:

Find the property tax paid by homeowner.

Home Value: \$136,000

Property tax rate:  $3\frac{1}{4}\% = 3.25\%$

$$\frac{\text{Property tax}}{\text{Home value}} = \frac{\text{Property tax rate } \%}{100}$$

$$\frac{x}{136000} = \frac{3.25}{100}$$

$$x = \$4420$$



6.6 Find the total income.

(ex) Base Salary : \$375/wk  
Total Sales : \$2850/wk  
Commission Rate : 6%

\_\_\_\_\_ = \_\_\_\_\_

(ex) Base Salary : \$880/mo  
Total Sales : \$13500/mo  
Commission rate : 6.2%

	S Sale	R Commission rate	C Commission
①	\$ 1300.00	2%	<u>C = \$26</u>
②	\$ <u>53,375</u>	4%	\$ 2135.00
③	\$ 650	<u>3.5%</u>	\$ 22.75
		③ $\frac{22.75}{650} = \frac{R}{100}$ R = <u>3.5%</u>	

$$\frac{\text{Commission}}{\text{Total Sales}} = \frac{\text{Commission rate \%}}{100}$$

Total Income = Base Salary + Commission

$$\text{① } \frac{C}{1300.00} = \frac{2}{100} \quad C = 26$$

$$\text{② } \frac{2135}{\text{Sales}} = \frac{4}{100} \quad \text{Sales} = \$53,375$$