

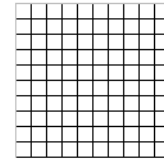
**Chapter 8**

% → PER 100



PARTS PER 100 PARTS →

$\frac{\quad}{100}$

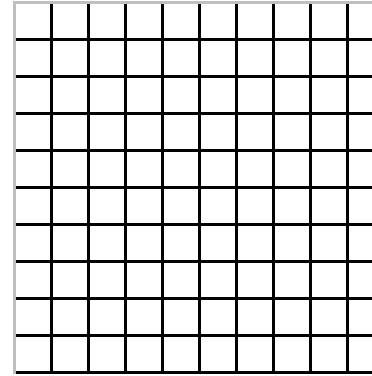


**27%** → **27** PER 100

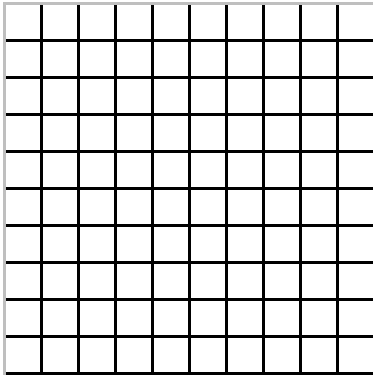


**27** PARTS PER 100 PARTS →

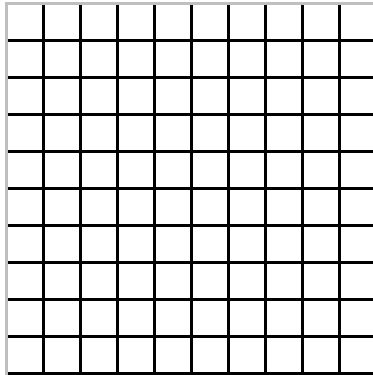
$\frac{27}{100}$



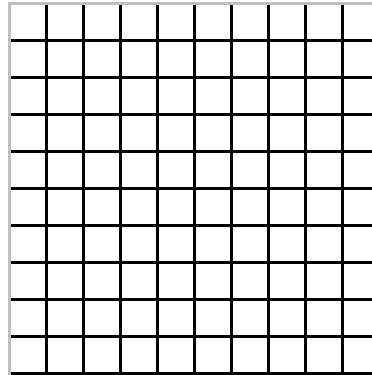
**Shade 3%**



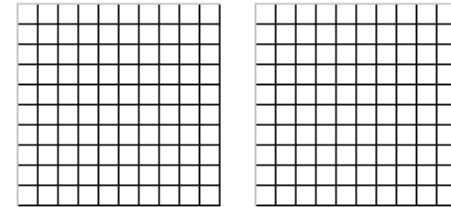
**Shade 40%**



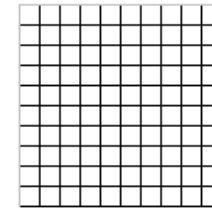
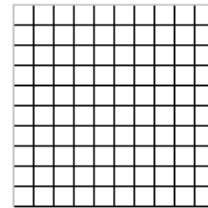
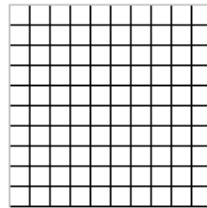
**Shade 57%**



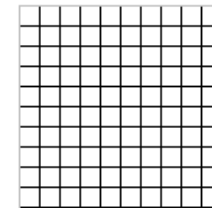
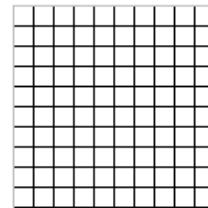
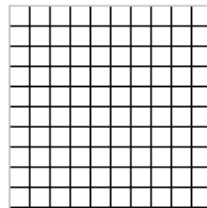
**Shade 112%**



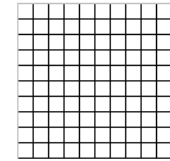
**Show me three different ways to shade 25%**



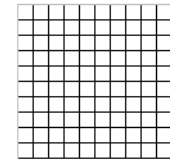
**Show me three different ways to shade 50%**



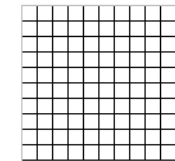
$\%$   $\longrightarrow$  PER 100  $\longrightarrow$  PARTS PER 100 PARTS  $\longrightarrow$  Fraction  $\frac{\quad}{100}$   $\longrightarrow$  Decimal  $\div 100$



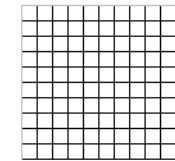
**27%**  $\longrightarrow$  **27** PER 100  $\longrightarrow$  **27** PARTS PER 100 PARTS  $\longrightarrow$   $\frac{27}{100}$   $\longrightarrow$  **27**  $\div 100 = 0.27$



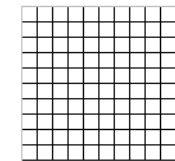
**33%**  $\longrightarrow$  PER 100  $\longrightarrow$  PARTS PER 100 PARTS  $\longrightarrow$   $\frac{\quad}{100}$   $\longrightarrow$   $\div 100 =$



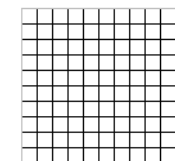
$2\frac{1}{3}\%$   $\longrightarrow$  PER 100  $\longrightarrow$  PARTS PER 100 PARTS  $\longrightarrow$   $\frac{\quad}{100}$   $\longrightarrow$   $\div 100 =$



**113%**  $\longrightarrow$  PER 100  $\longrightarrow$  PARTS PER 100 PARTS  $\longrightarrow$   $\frac{\quad}{100}$   $\longrightarrow$   $\div 100 =$



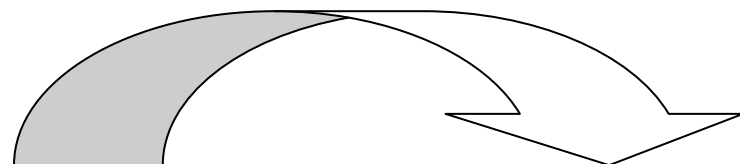
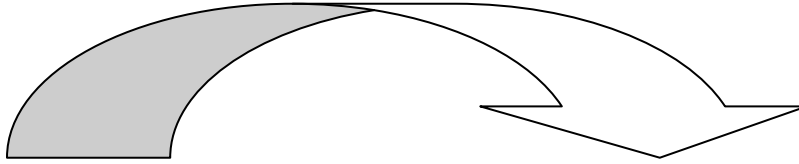
**1.3%**  $\longrightarrow$  PER 100  $\longrightarrow$  PARTS PER 100 PARTS  $\longrightarrow$   $\frac{\quad}{100}$   $\longrightarrow$   $\div 100 =$



$$0.2 = \%$$

Divide

move the decimal  
to the right two units



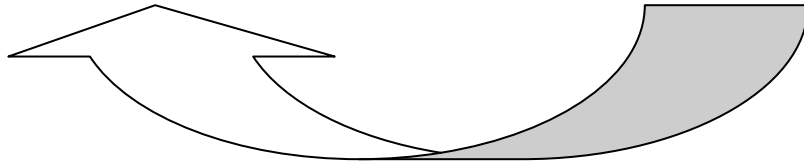
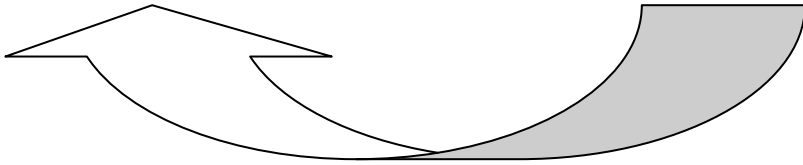
$$\frac{1}{5}$$

**=**

$$.2$$

**=**

$$20\%$$

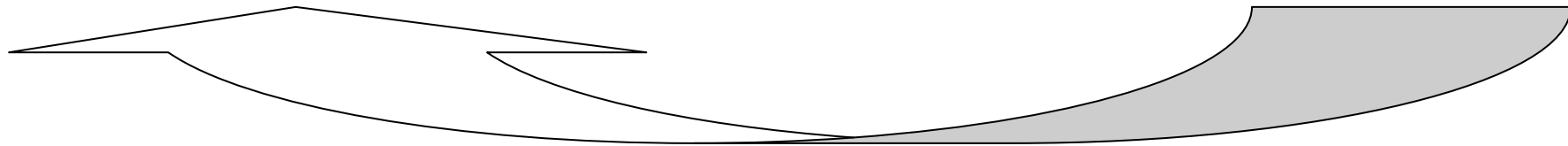


Last place value =  
Denominator (zeros = decimal places)

move the decimal  
to the left two units

$$.2 = \frac{\quad}{10} = \text{---}$$

$$= 20\%$$



Percent means per 100

$$20\% = \text{---} = \text{---}$$

Changing a fraction to a Decimal. Round to the nearest thousandth.

$$\frac{7}{17}$$

$$2\frac{3}{7}$$

---

Changing a fraction to a Percent.

$$\frac{7}{17}$$

$$2\frac{3}{7}$$

---

Changing a percent to a decimal.

35%

8.75%

$2\frac{3}{7}\%$

---

Changing a percent to a fraction.

35%

8.75%

$2\frac{3}{7}\%$

---

Changing a decimal to a percent

0.31

10.375

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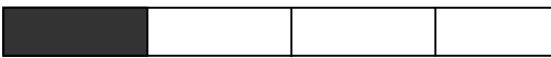
Changing a decimal to a fraction


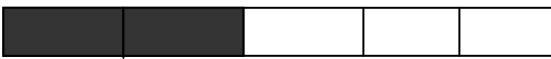
0.31


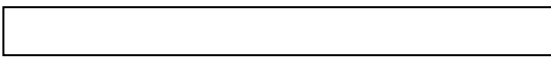
10.375


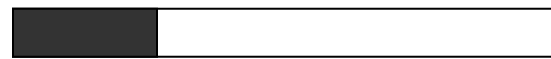
Decimal	Percent	Mixed number/fraction
.23		
		$\frac{2}{5}$
		$\frac{3}{4}$
	33%	
	22.5%	
.515		
		$\frac{7}{16}$
	0.005%	
11111.0001		
		$\frac{21}{100}$
35.1		
	$33\frac{1}{3}\%$	
	$5\frac{1}{4}\%$	
	Exact fractional percent	$\frac{2}{3}$
		$5\frac{2}{25}$
1.8		


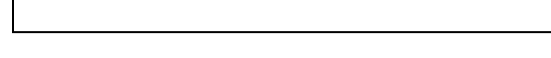
approximate the following by shading in the rectangle:


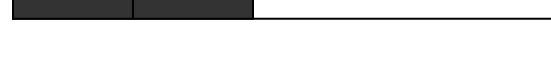
$\frac{1}{4}$  of  is 


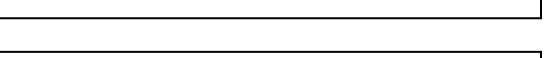
$\frac{2}{5}$  of  is 


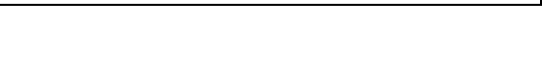
$\frac{3}{4}$  of  is 

25% of  is 

30% of  is 

40% of  is 

10% of  is 

50% of  is 

Find the following by multiplying:

25% of 42 is \_\_\_\_\_

33% of 35 is \_\_\_\_\_

3% of 100 is \_\_\_\_\_

20% discount on \$400 is a \_\_\_\_\_ discount

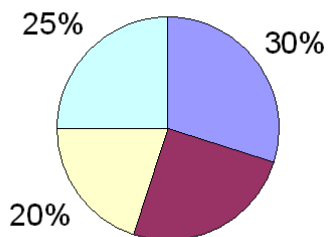
35% increase on a salary of \$40,000 is a \_\_\_\_\_ increase on a salary

8.25% sales tax on a purchase of \$42.95 is \_\_\_\_\_ in tax

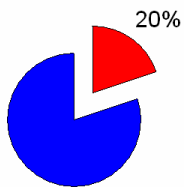
3% commission on a sale of \$35,000 is a \_\_\_\_\_ commission

2% of the 30 people in this class love math. \_\_\_\_\_ people in this class love math.

4.5% simple interest APR on \$3500 loan is a fee of \_\_\_\_\_ per year.



Find the missing percentage.



Find the missing percentage.

You pay 80% of what an item sells for. If the item sells for \$495.25, then you pay \_\_\_\_\_.

What percent discount is the above \_\_\_\_\_

What amount is the discount above. \_\_\_\_\_

Answer the following mentally (no calculator):

- 1) Find the given percentage of 50: a) 10%      b) 20%      c) 60%      d) 5%      e) 1%
- 2) Find the given percentage of 40: a) 10%      b) 20%      c) 60%      d) 5%      e) 1%
- 3) Find the given percentage of 25: a) 10%      b) 20%      c) 60%      d) 5%      e) 1%

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(No calculator)

i) You are looking at a shirt that costs \$40 and you have a 20% off coupon. How much will you pay before tax?

ii) What if you find a 25% off coupon. How much will you pay before tax? (hint: 25% = 20% + 5%)

iii) You find a Vase that is originally priced \$60 and is clearance 50%. How much will you pay before tax if you use your 25% off coupon?

iiii) If your bill comes out to \$44.05 including tax. Approximately what tip should you leave if the customary tip is 15%?

## Percent equations with of, is (method 1)

$$\frac{1}{4} \text{ of } 8 \text{ is } 2$$

$$\begin{array}{ccc} \downarrow & & \downarrow \\ \frac{1}{4} \cdot 8 = 2 \end{array}$$

\*of, with a number next to it, means multiply

\*is means equals

$$25\% \text{ of } 8 \text{ is } 2$$

$$\begin{array}{ccc} \downarrow & & \downarrow \\ 0.25 \cdot 8 = 2 \end{array}$$

What number is 20% of 45.

$$X = 0.20 \cdot 45$$

$$X = 9$$

So, 9 is 20% of 45

a) what is 15% of 30

b) What percent of 34 is 22

c) 10% of what number is 22

1) What number is 82% of 300

2) 39.6 is 44% of what number?

3) .5 is what percent of 40,000?

4) What percent of 3,200 is 1,400?

5)  $66\frac{2}{3}\%$  of what number is 28?

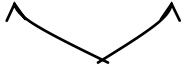


- 1 20 % of 40 people are bad drivers. How many bad drivers are there?
- 2 10% of 30 dogs have flees. How many dogs have flees
- 3 52% of a 40 oz bottle of welches grape juice is sugar. What does this mean?
- 4 A 10% **discount** was given on a price of \$35. What does this mean?
- 5 A 20% **decrease in a population** of 40,000 was seen. What does this mean?
- 6 A 3% **commission** was given on a sale of \$35,000. What does this mean?

### Percents

The PART is a % of the WHOLE (original)

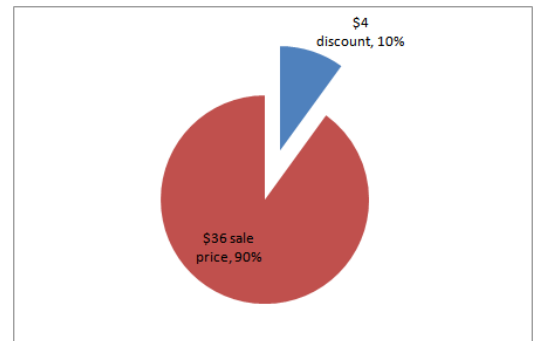
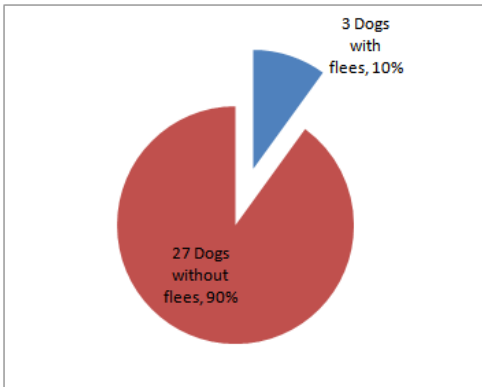
$$\text{PART} = \% \bullet \text{ the WHOLE}_{(\text{original})}$$



$$\% \frac{\square}{100} = \frac{\text{part}}{\text{WHOLE}}$$

The part and the percent represent the same thing.

10% of 30 dogs have flees. → 3 dogs have flees.



A 10% discount on a \$40 shirt. → \$4 discount

Of the following circle the ones that represent the WHOLE.

- |                                |                            |                            |
|--------------------------------|----------------------------|----------------------------|
| 1 people                       | planet                     | _____ are a % of the _____ |
| 2 dog                          | hair                       | _____ is a % of the _____  |
| 3 bottle of juice              | grapes                     | _____ are a % of the _____ |
| 4 college                      | engineering students       | _____ are a % of the _____ |
| 5 class                        | women                      | _____ are a % of the _____ |
| 6 heroes                       | superman                   | _____ is a % of the _____  |
| 7 income                       | money spent on food        | _____ is a % of the _____  |
| 8 questions answered correctly | test                       | _____ are a % of the _____ |
| 9 discount                     | Original price             | _____ is a % of the _____  |
| 10 city                        | buildings                  | _____ are a % of the _____ |
| 11 solution                    | alcohol                    | _____ is a % of the _____  |
| 12 shipment of parts           | defective parts            | _____ are a % of the _____ |
| 13 people                      | people under the age of 20 | _____ are a % of the _____ |
| 14 Drivers                     | Bad drivers                | _____ are a % of the _____ |

1. Identify the WHOLE and give it's value.
2. Identify the part and give it's value including its discription.  
I.e. decrease, increase, discount, tax, defective parts...
3. Identify the percent and give it's value including its discription.  
I.e. rate of decrease, rate of increase, discount rate, tax rate, percent of defective parts...
4. Set up an equation and solve.

1) a) An engineering student answered 81 questions correctly on a 90-question trigonometry test. What percent of the questions did she answer correctly?

WHOLE  $\longrightarrow$   
 Part  $\longrightarrow$   
 Percent  $\longrightarrow$

$$\frac{\text{correct questions}}{\text{PART}} = \frac{\% \text{ of correct questions}}{\%} * \frac{\text{WHOLE}}{\text{WHOLE}}$$

2) a) How much acetic acid is in a 5-liter container of acetic acid and water that is marked 80% acetic acid?

WHOLE  $\longrightarrow$   
 Part  $\longrightarrow$   
 Percent  $\longrightarrow$

$$\frac{\text{liters of acetic acid}}{\text{PART}} = \frac{\% \text{ of acetic acid}}{\%} * \frac{\text{WHOLE}}{\text{WHOLE}}$$

3) Of the 420 students enrolled in a basic math class, only 30% are first-year students. How many are first-year students?

WHOLE  $\longrightarrow$   
 Part  $\longrightarrow$   
 Percent  $\longrightarrow$

$$\frac{\text{PART}}{\text{PART}} = \frac{\%}{\%} * \frac{\text{WHOLE}}{\text{WHOLE}}$$

4) A solution of alcohol and water is 80% alcohol. The solution is found to contain 32 milliliters of alcohol. How many milliliters total (both alcohol and water) are in the solution?

WHOLE  $\longrightarrow$   
Part  $\longrightarrow$   
Percent  $\longrightarrow$

$$\frac{\text{PART}}{\text{WHOLE}} = \frac{\%}{100}$$

5) In a shipment of airplane parts, 3% are known to be defective. If 15 parts are found to be defective, how many parts are in the shipment?

WHOLE  $\longrightarrow$   
Part  $\longrightarrow$   
Percent  $\longrightarrow$

$$\frac{\text{PART}}{\text{WHOLE}} = \frac{\%}{100}$$

6) 75% of the students have had algebra. If there are 300 students, how many of them have had algebra?

9) You paid \$40 for a shirt on sale. The original price of the shirt was \$52. What was the **discounted** rate? (rate is a word used to represent percent)

Need to find the discount in order to find the discounted rate

**Part= % • Whole**

**Discount= (discount rate)% • Original price**

**Sale price= (sale price rate)% • Original price**

**Increase= (increase rate)% • Original amount**

**Decrease= (decrease rate)% • Original amount**

**Commission= (commission rate)% • Whole**

**Sales tax = (Sales tax)% • Total(cost before tax)**

**Mark up= (Mark up rate)% • Cost**

**Sale price = Regular Price(total) - Discount**

**Sale price rate = 100% - Discount rate**

**Selling price = Cost + Mark up**

**Mark up = Selling price - Cost**

1. a) Your dog costs \$45. The sales tax has a rate of 8.75%. What is the Tax for your dog?

b) What is the total price of your dog including sales tax?

*Cost is* \_\_\_\_\_

**Hint:**

*+ Tax is* \_\_\_\_\_

*Price including tax is* \_\_\_\_\_

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5. Your dinner cost \$45. Your tax was \$3.71. What was the tax rate?

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1. Mia makes 12% commission on all of her sales. This month she sold \$9,000 worth of merchandise. What was her commission?

3. Christina sold \$4000 worth of merchandise. If she made \$480 in commission, then what is her commission rate?

4. Maria gets a commission rate of 25% of what she sells. If her commission for the day was \$200, then what was the total value of the merchandise she sold?

1. a) Your current salary is \$42,159 per year. If your boss gives you an 8% increase in salary, then how much more money will you make a year?  
  
b) What will your new annual salary be?
2. a) In one year your car decreases \$4,000. If your car is worth \$45,000, then What is the percent decrease for your car?
3. A student making \$8.50 gets a \$0.70 raise. What is the percent increase?
4. Shoes that normally sell for \$50 are on sale for \$20. What is the percent decrease?
5. Light beer has 20% fewer calories than regular beer. If regular bear has 180 calories, then how many calories are in light beer?
6. a) A bicycle costing \$110 has a markup rate of 55%. Find the markup.  
  
b) Find the selling price of the bike.
7. A freezer is selling for \$520 cost the appliance dealer \$360. Find the markup rate.

1. a) A shirt you have been looking at is 20% off. If the regular price is \$45, then what is the discount for the shirt?

b) What is the Sale price for the shirt?

**Regular price** \_\_\_\_\_

**- Discount** \_\_\_\_\_

**Sale price** \_\_\_\_\_

2. a) You have a 40% off coupon for your entire purchase. If the regular prices for your items are \$4, \$5, and \$7, then what is your discount?

b) What is the Sale price for all of your items?

**Sum of the Regular prices** \_\_\_\_\_

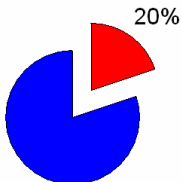
**- Discount** \_\_\_\_\_

**Sale price** \_\_\_\_\_

3. A bedroom set that normally sells for \$1450 is on sale for 10% off. If the sales tax rate is 5%, then what is the total price of the bedroom set after the discount and including sales tax?

---

**If you have a 20% off coupon then what percentage of the original price are you paying for?**



4. A shirt is on sale with a **discount** of 20%. If the **sale price** is \$35.95, what was the original price?

$$I = Prt$$

$$\text{Simple Interest} = (\text{simple interest rate})\% \cdot \text{Total} \cdot \underline{\text{Years}}$$

1. How much simple interest is owed on \$5,000 if borrowed for 1 year at 5%?

Interest rate	Principle	Years	Simple Interest
		=	

2. a) How much simple interest is owed on \$2,000 if borrowed for 7 year at 6%?

Interest rate	Principle	Years	Simple Interest
		=	

b) What is the maturity value of the loan?

$$\text{Simple Interest} = (\text{simple interest rate})\% \cdot \text{Total} \cdot (\text{Fraction of the year})$$

39 days is  $\frac{39}{365}$  of a year

5 months is  $\frac{5}{12}$  of a year

3. a) What fraction of the year is 40 days?

b) What fraction of the year is 3 months?

4. How much simple interest is owed on \$5,000 if borrowed for 5 months at 5%?

Interest rate	Principle	Fraction of a Year	Simple Interest
		=	

5. a) How much simple interest is paid on a loan of \$3,500 for 90 days at 5%?

b) What is the maturity value of the loan?

6. Chase is offering a 3.25% car loan. If you can only afford a maturity value of \$15,000 for a 5 year loan, then what amount of money can you borrow?

7. A \$12,000 investment earned \$462 in interest in 6 months. Find the annual simple interest rate on the loan.

## Life Stuff

1. A monkey is on sale for 35% off. If the retail price is \$4,555, then find the total cost including 9.25% sales tax.
2. You decide to furnish your living room with furniture from Macy's. You find a couch and chair set for \$2550, a coffee table for \$456, and a tv stand for \$259. If the current sale is "take 30% off and an additional 20% off," then find your total cost including 9.25% sales tax.
3. What was the actual percentage off the total in 2?
4. After 4 hours of bartering with your local dealer, you agree on a price of \$21,563.57 for a new car. Your fees are 9.25% for taxes and 3% for license and registration.
  - a) What is the total cost of your new car, not including insurance.
  - b) If you put 20% down to qualify for a loan, then how much did you put down and how much do you have left to pay, not including interest?
5. You have just enjoyed a nice lunch at Tokyo Hibachi with your friends. The cost of your hibachi steak with fried rice was \$14. Assuming you will pay for tax and tip, how much should you leave on the table? (no coins can be left because it will make you look cheep)  
( You cannot use your phone because the battery is dead. You must use your brain)  
tax rate=10%  
tip rate= 15% 