This situation -- interest paid to the investor at regular intervals on the amount invested -- is called simple interest. Bank accounts don't usually work this way. The interest is deposited into the account so the amount of money earning interest grows bigger. This more common way of accruing interest is called compound interest and is the subject of the next section.

## Exercise Set 1.1

1) a) What is $25 \%$ of 188 ?
b) What percent of 80 is 66 ?
c) $16 \%$ of what number is 35 ?
2) 

a) What is $80 \%$ of 208 ?
b) What percent of 44 is 27 ?
c) $8 \%$ of what number is 122 ?
3) a) What is $75 \%$ of 110 ?
b) What percent of 56 is 30 ?
c) $12 \%$ of what number is 35 ?
4) a) What is $3 \%$ of 1,024 ?
b) What percent of 1,000 is 245 ?
c) $11 \%$ of what number is 15 ?
5) A store is having a $10 \%$ off sale on all merchandise. What will the following items cost on sale: A designer sweater that retails for $\$ 149.00$, a leather wallet that retails for $\$ 49.99$, a man's suit that retails for 799.00 ?
6) A building supply store manager gets the bright idea to mark up selected items $50 \%$ and then have a $50 \%$ off sale, thinking he can come out even. How much will he lose on the sale of a $\$ 4600.00$ hot tub?
7) Greg and Marsha hired a contractor to build their house for "cost plus 10 ," i.e., the cost of materials and labor plus $10 \%$. Another contractor offered to build the house for a flat rate of $\$ 122,000.00$, but Greg chose not to use him. If the cost of materials and labor totaled $\$ 111,432.26$, how much did Greg and Marsha pay? Would they have been better off with the flat rate builder? Why?
8) A builder borrowed $\$ 21,000$ for one year to purchase equipment. If he paid $\$ 2225$ in simple interest, what percent interest did he pay?
9) Of the 87 senior mathematical science majors at a particular institution, 45 are specializing in secondary education, 37 are specializing in computer science 4 are specializing in statistics, and the rest are either pure math or applied math majors. What percent of the mathematical science majors are specializing in:
a) computer science?
b) statistics?
c) secondary education?
d) math or applied math?
10) An attorney wishes to purchase a building in which to locate her office. She finds two buildings, one within city limits and one out in the county. She was warned that the real estate taxes are calculated differently in the two locations. The city charges 400 mills ( $\$ 4.00$ per $\$ 1,000$ of assessed value) with assessment at $90 \%$ of market value. The county charges 460 mills ( $\$ 4.60$ per $\$ 1,000$ of assessed value) with assessment at $50 \%$ of market value. If the properties have market values of $\$ 125,000$ each, what are the taxes on the two buildings?
11) A developer has a 92.5 foot wide lot on which he wants to build a house. The local building codes require that $15 \%$ of the width of the lot be reserved for side yards and that the house be no closer than 10 feet to any property line. Is the lot wide enough for a 59 foot wide house?

## 1 - Finance

12) Each time a song is played on the radio, the record company and the songwriter are paid a royalty of $\$ 0.30$. Of the total, $75 \%$ goes to the company and the rest to the writer. If on a network of 50 radio stations, a certain song is played 4 times a day during the first week and then 20 times a day for the next three weeks, how much does the network owe in royalties for the four weeks? How much do the record company and the songwriter receive each?

A fundamental knowledge of basic proportions and percents is very helpful on the Graduate Record Examination (GRE). The questions below are similar in structure and content to those appearing in the quantitative section of the GRE. The directions for problems 13 through 15 are: Each of the following problems contains two quantities labeled $A$ and $B$. Determine the relationship between the sizes of the quantities. Answer (A) if $\mathrm{A}>\mathrm{B},(\mathrm{B})$ if $\mathrm{A}<\mathrm{B},(\mathrm{C})$ if $\mathrm{A}=\mathrm{B}$, or (D) if the relationship between A and B cannot be determined. Explain your reasoning.
13) A: $6 \%$ of $9 \quad$ B: $9 \%$ of 6
14) A hardware store purchased hammers for $\$ 7$ each and sold them for $25 \%$ above cost.
A: $\$ 9.10$
B: The price at which the store sold a hammer.
15)
A: $30 \%$ of 50
B: $\frac{3}{10}(50)$

The GRE also contains multiple choice questions similar to problems 16 through 20 below. Explain the reason for your answer.
16) $0.75 \%=$
a) $\frac{3}{4}$
b) $\frac{3}{40}$
c) $\frac{3}{400}$
d) $\frac{3}{4000}$
e) $\frac{3}{40000}$
17) $\frac{3}{4} \%=$
a) $\frac{3}{4}$
b) $\frac{3}{40}$
c) $\frac{3}{400}$
d) $\frac{3}{4000}$
e) $\frac{3}{40000}$
18) A widow received $50 \%$ of her husband's estate, and each of her four sons received $25 \%$ of the balance. If the widow and one of her sons received a total of $\$ 100,000$ from the estate, what was the amount of the estate?
a) 125,000
b) 140,000
c) 160,000
d) 200,000
e) 300,000
19) The estate of a retired banker amounted to $\$ 750,000$. The will gave the widow $\$ 300,000$ and divided the rest evenly between 3 children. What percent of the estate did each child receive?
a) $15 \%$
b) $18 \%$
c) $20 \%$
d) $22 \%$
e) $25 \%$
20) If $\$ 1000$ is deposited into an account paying 5 percent interest in one year, how much interest is earned?
a) $\$ 5$
b) $\$ 50$
c) $\$ 100$
d) $\$ 250$
e) $\$ 500$

