MAT 098
Beginning Algebra Part 2
Section 3.5 Required Assignment Worksheet
Application Problems

For each of the following problems:

a. Identify the variable.
b. Write an equation.
c. Solve the equation.
d. Answer the question and check for reasonableness.

1. Sue worked 7 hours more than twice the number of hours worked by Jim. The total number of hours worked by both of them is 49. Find the number of hours worked by each.

2. The sum of two consecutive odd integers is 40. Find the integers.

3. Mary received a 5% increase in her salary and her salary now is $33,800. What was her previous salary?

4. The length of a rectangle is 3 feet less than three times its width. If the perimeter of the rectangle is 34 feet, find the dimensions of the rectangle.

5. A bus travel 150 miles on 10 gallons of gas. How many gallons will it need to travel 225 miles?

6. Marsha can check 13 parts per minute on an assembly line. How many parts will she be able to check in 3 hours?

7. On the first day of their vacation trip the Lopez family traveled 407 miles in 11 hours. What was their average speed?

8. On the fifth day of their vacation trip the Lopez traveled 216 miles in 6 hours. What was their average speed?

9. A van travels 200 miles on 10 gallons of gas. How many gallons will it need to travel 340 miles?

10. Marvin can check 15 parts per minute on an assembly line. How many parts will he be able to check in 6 hours?

11. On the fifth day of their vacation trip the Nelson family traveled 185 miles in 5 hours. What was their average speed?

12. A train traveling at 40 miles per hour leaves for a certain town. One hour later, a bus traveling at 50 miles per hour leaves for the same town and arrives at the same time as the train. If both the train and the bus traveled in a straight line, how far is the town from where they started?
13. Train A leaves a station traveling at 40 mph. Eight hours later, train B leaves the same station traveling in the same direction at 60 mph. How long does it take for train B to catch up to train A?

14. Train A leaves a station traveling at 50 mph. Four hours later, train B leaves the same station traveling in the same direction at 60 mph. How long does it take for train B to catch up to train A?

15. Two trains, an express and a commuter, are 450 miles apart. Both start at the same time and travel toward each other. They meet 6 hours later. The speed of the express is 25 mph faster than the commuter. Find the speed of each train.

16. Two trains leave a depot at the same time, one traveling North at 60 mph and the South at 50 mph. How long will it take before the trains are 550 miles apart?

17. Train A leaves Station A traveling at 40 mph at the same time that Train B leaves Station B at 60 mph. If Station A and Station B are 325 miles apart and the trains are traveling toward each other, how many hours is it before the two trains meet? How far are they from Station B when they meet?

18. Two cars are traveling in opposite directions at average rates of 60 mph and 72 mph. How many hours will it take before the cars are 198 miles apart?

19. George invested $19,000 for one year, part of 11% and part at 12%. If he earned a total interest of $2,200, how much was invested at each rate?

20. Cindy invested $24,000 for one year, part at 6% and part at 9%. If she earned a total interest of $1740, how much was invested at each rate?

21. How many liters of 18% salt solution must be added to 92 liters of 61% salt solution to get a 41% salt solution?

22. How many pounds of coffee beans selling for $2.80 per pound should be mixed with 2 pounds of coffee beans selling for $1.60 a pound to obtain a mixture selling for $2.56 per pound?

23. How many pounds of salted nuts selling for $3.00 per pound should be mixed with 7 pounds of salted nuts selling for $1.20 a pound to obtain a mixture selling for $1.74 per pound?

24. How many liters of 24% salt solution must be added to 76 liters of 64% salt solution to get a 43% salt solution?

25. How many pounds of salted nuts selling for $1.60 per pound should be mixed with 3 pounds of salted nuts selling for $3.00 a pound to obtain a mixture selling for $2.02 per pound?

26. How many pounds of gourmet candy selling for $2.40 per pound should be mixed with 3 pounds of gourmet candy selling for $1.20 a pound to obtain a mixture selling for $2.04 per pound?
27. How many pounds of gourmet candy selling for $2.00 per pound should be mixed with 2 pounds of gourmet candy selling for $3.00 per pound to obtain a mixture selling for $2.20 per pound?

28. A total of 10 pounds of apples and grapes costs $12.30. The apples cost $1.29 per pound and the grapes cost $1.19 per lb. How many pounds of apples are there?

29. One thousand two hundred people attended a college basketball game. Student tickets cost $4 and all other tickets cost $15. If the receipts for the game totaled $12,786, how many of each kind of ticket was sold?

30. A landscaper has a budget of $2250 to plant 100 azaleas and rhododendrons around a new office building. If there is a cost of $40 per rhododendron and $15 per azalea, how many of each can she plant?

31. You inherit $16,000 and invest in two stocks that pay 6% and 8% annual interest. If the total interest is $1180, how much is invested at each rate?

32. A chemist needs 12 liters of a 36% acid solution. How many liters of 18% acid should be combined with a 45% acid solution to obtain the proper mixture?

33. How many ounces of a 15% alcohol solution must be mixed with 4 ounces of a 20% alcohol solution to make a 17% alcohol solution?

34. How much candy costing $2.50 per pound must be mixed with candy costing $3.50 per pound to create 100 pounds of mixed candy selling at $2.90 per pound?
1. Jim, 14 hours; Sue, 35 hours.
2. 19 and 21.
3. $32,000
4. Width, 5 feet; length, 12 feet.
5. 15 gallons
6. 2340 parts
7. 37 mph
8. 36 mph
9. 17 gallons
10. 5400 parts
11. 37 mph
12. 200 miles
13. 16 hours
14. 20 hours
15. Express, 50 mph; commuter 25 mph
16. 5 hours.
17. 3.25 hours; 195 miles
18. 1.5 hours
19. $8000 at 11%; $11,000 at 12%
20. $14,000 at 6%; $10,000 at 9%
21. 80 liters
22. 8 lb
23. 3 lb
24. 84 liters
25. 7 lb
26. 7 lb
27. 8 lb
28. 4 lb of apples; 6 lb of grapes.
29. 474 student tickets; 726 all others
30. 30 rhododendron; 70 azaleas
31. $5000 at 6%; $11,000 at 8%.
32. 4 liters of 18%; 8 liters of 45%.
33. 6 ounces.
34. 60 pounds of $2.50 candy; 40 pounds of $3.50 candy.