

Algebra I Pre-AP – Linear Functions Applications Homework # 203

Work all problems on notebook paper.

Assume that each situation below can be described by a linear function.

- Example 1: The charge for a one-day rental of a car is \$24 plus 15 cents for each mile driven.
- Write a function to express the rental cost as a function of the number of miles driven.
  - Use your function to find the cost of driving 85 miles.
  - Use your function to find how many miles you can drive for a charge of \$42.

- Example 2: A plumber charges \$110 for a 3-hour job and \$160 for a five-hour job.
- Write a function to express the plumber's charge as a function of the hours worked.
  - Use your function to find the cost of an 8-hour job.

- A photocopying machine purchased new for \$4500 loses \$900 in value each year.
  - Write a function that expresses the machine's value as a function of number of years.
  - Find the value of the machine in 18 months.
  - When will the value be \$1575?
- It costs Ace Electronics Company \$1900 to manufacture 10 DVD players and \$2200 to manufacture 16 DVD players.
  - Write a function that expresses the cost as a function of the number of DVD players.
  - Find the cost of manufacturing 25 DVD players.
  - Find the average cost per DVD player if they manufacture 100 units.
- A load of 8 kg attached to the bottom of a coil spring stretches the spring to a length of 76 cm, and a load of 14 kg stretches it to a length of 85 cm. Find the natural (unstretched) length of the spring.
- A climber left base camp at 5 am to ascend a 7400-meter peak. The climber gained altitude at the rate of 240 m/hr and at 8 am was at an altitude of 6500 m.
  - Write a function that expresses the climber's altitude as a function of the number of hours he has been climbing.
  - Find the elevation of the base camp.
  - At what time did the climber reach the summit?
- Allied Airlines charges \$90 for a ticket to fly between two cities 260 miles apart and \$150 for a ticket to fly between two cities 500 miles apart.
  - Write a linear function that describes the cost of a ticket as a function of the number of miles flown.
  - Use your function from part a) to find the cost for a trip between two cities 1000 miles apart?

- At the West Texas Balloon Festival, a hot-air balloon is first sighted at an altitude of 1400 feet and appears to be descending at a steady rate of 35 feet per minute.
  - Write a function **in function notation** that expresses the altitude of the balloon from the ground as a function of the number of minutes since it was first sighted.
  - Find the altitude of the balloon from the ground a half hour from when it was first sighted.
  - A second balloon is descending at 25 feet per minute, and 11 minutes after it begins its descent, its altitude is 775 feet. Write a function **in function notation** that describes its altitude as a function of the number of minutes it has been descending.
  - How long will it take for this balloon to land?
  - Explain, in detail, the difference in methods you would use to answer questions A & B about the first balloon and questions C & D about the second balloon