

## Absolute Value Word Problems

- 1) A machine is used to fill each of several bags with 16 ounces of sugar. After the bags are filled, another machine weighs them. If the bag weighs .3 ounces more or less than the desired weight, the bag is rejected. Write this equation to find the heaviest and lightest bag the machine will approve.
  
- 2) The average number of seeds in a package of cucumber seed is 25. The number of seeds in the package can vary by three. What are the maximum and minimum number of seeds that could be in a package?
  
- 3) The mean distance of the earth from the sun is 93 million miles. The distance varies by 1.6 million miles. What are the maximum and minimum distances of the earth from the sun?
  
- 4) Leona was in a golf tournament last week. All of her four rounds of golf were within 2 strokes of par. If par was 72, what are the maximum and minimum scores that Leona could have made in the golf tournament?
  
- 5) Victor has a goal of making \$75 per week at his after-school job. Last month he was within \$6.50 of his goal. What are the maximum and minimum amounts that Victor might have made last month?
  
- 6) Members of the track team can run 400 m in an average time of 58.2 seconds. The fastest and slowest times varied from the average by 6.4 seconds. What were the maximum and minimum times for the track team?
  
- 7) Amtrak's annual passenger revenue for the years 1980-2000 is modeled approximately by the formula  $R = -40|x - 11| + 990$  where R is the annual revenue in millions of dollars and x is the number of years since January 1, 1980. In what years was the passenger revenue \$790 million?

## Answers

- 1)  $|x - 16| = 0.3x$  is the bag's weight.  $X=15.7$  oz,  $16.3$  oz
- 2)  $|x - 25| = 3$ ;  $x= 22$  seeds,  $23$  seeds
- 3)  $|x - 93| = 1.6$ ;  $x= 91.4$  million,  $94.6$  million
- 4)  $|x - 72| = 2$ ;  $x= 70$  strokes,  $74$  strokes
- 5)  $|x - 75| = 6.5$ ;  $x= \$68.50$ ,  $\$81.50$
- 6)  $|x - 58.2| = 6.4$ ;  $x= 51.8$  seconds,  $64.6$  seconds
- 7)  $790 = -40|x - 11| + 990$  Solve for  $|x - 11|$   $-200 = -40|x - 11|$   $5 = |x - 11|$  So  $x - 11$  is either equal to  $5$  or to  $-5$ , the two numbers with an absolute value of  $5$ .  $X = 6, 16$ , so in  $1986$  and  $1996$ .