

A.A.6: Modeling Inequalities: Analyze and solve verbal problems whose solution requires solving a linear equation in one variable or linear inequality in one variable

- 1 In a hockey league, 87 players play on seven different teams. Each team has at least 12 players. What is the largest possible number of players on any one team?
 - 1) 13
 - 2) 14
 - 3) 15
 - 4) 21

- 2 There are 461 students and 20 teachers taking buses on a trip to a museum. Each bus can seat a maximum of 52. What is the *least* number of buses needed for the trip?
 - 1) 8
 - 2) 9
 - 3) 10
 - 4) 11

- 3 An online music club has a one-time registration fee of \$13.95 and charges \$0.49 to buy each song. If Emma has \$50.00 to join the club and buy songs, what is the maximum number of songs she can buy?
 - 1) 73
 - 2) 74
 - 3) 130
 - 4) 131

- 4 Tamara has a cell phone plan that charges \$0.07 per minute plus a monthly fee of \$19.00. She budgets \$29.50 per month for total cell phone expenses without taxes. What is the maximum number of minutes Tamara could use her phone each month in order to stay within her budget?
 - 1) 150
 - 2) 271
 - 3) 421
 - 4) 692

- 5 Parking charges at Superior Parking Garage are \$5.00 for the first hour and \$1.50 for each additional 30 minutes. If Margo has \$12.50, what is the maximum amount of time she will be able to park her car at the garage?
 - 1) $2\frac{1}{2}$ hours
 - 2) $3\frac{1}{2}$ hours
 - 3) 6 hours
 - 4) $6\frac{1}{2}$ hours

- 6 Peter begins his kindergarten year able to spell 10 words. He is going to learn to spell 2 new words every day. Write an inequality that can be used to determine how many days, d , it takes Peter to be able to spell *at least* 75 words. Use this inequality to determine the minimum number of whole days it will take for him to be able to spell *at least* 75 words.

- 7 A swimmer plans to swim at least 100 laps during a 6-day period. During this period, the swimmer will increase the number of laps completed each day by one lap. What is the *least* number of laps the swimmer must complete on the first day?
- 8 A prom ticket at Smith High School is \$120. Tom is going to save money for the ticket by walking his neighbor's dog for \$15 per week. If Tom already has saved \$22, what is the minimum number of weeks Tom must walk the dog to earn enough to pay for the prom ticket?
- 9 A doughnut shop charges \$0.70 for each doughnut and \$0.30 for a carryout box. Shirley has \$5.00 to spend. At most, how many doughnuts can she buy if she also wants them in one carryout box?
- 10 Mr. Braun has \$75.00 to spend on pizzas and soda pop for a picnic. Pizzas cost \$9.00 each and the drinks cost \$0.75 each. Five times as many drinks as pizzas are needed. What is the maximum number of pizzas that Mr. Braun can buy?
- 11 The Eye Surgery Institute just purchased a new laser machine for \$500,000 to use during eye surgery. The Institute must pay the inventor \$550 each time the machine is used. If the Institute charges \$2,000 for each laser surgery, what is the *minimum* number of surgeries that must be performed in order for the Institute to make a profit?
- 12 Thelma and Laura start a lawn-mowing business and buy a lawnmower for \$225. They plan to charge \$15 to mow one lawn. What is the *minimum* number of lawns they need to mow if they wish to earn a profit of *at least* \$750?
- 13 Chelsea has \$45 to spend at the fair. She spends \$20 on admission and \$15 on snacks. She wants to play a game that costs \$0.65 per game. Write an inequality to find the maximum number of times, x , Chelsea can play the game. Using this inequality, determine the maximum number of times she can play the game.

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Answer Section

1 ANS: 3

To find the largest possible number of players on any one team, assume the other six teams have the minimum number of players.

$$p \leq 87 - (6 \times 12)$$

$$p \leq 15$$

REF: 089914a

2 ANS: 3

$$b \geq \frac{461 + 20}{52}$$

$$b \geq 9.25$$

$$b = 10$$

REF: 010101a

3 ANS: 1

$$13.95 + 0.49s \leq 50.00$$

$$0.49s \leq 36.05$$

$$s \leq 73.57$$

REF: 080904ia

4 ANS: 1

$$0.07m + 19 \leq 29.50$$

$$0.07m \leq 10.50$$

$$m \leq 150$$

REF: 010904ia

5 ANS: 2

$$5 + 3(h - 1) = 12.5$$

$$5 + 3h - 3 = 12.5$$

The hourly parking rate is \$3.

$$3h = 10.5$$

$$h = 3.5$$

REF: 060406a

6 ANS:

$$10 + 2d \geq 75, 33. \quad 10 + 2d \geq 75$$

$$d \geq 32.5$$

REF: 060834ia

7 ANS:

$$x + (x + 1) + (x + 2) + (x + 3) + (x + 4) + (x + 5) \geq 100$$

$$6x + 15 \geq 100$$

$$x \geq 14.\overline{1\bar{6}}$$

15.

$$x = 15$$

REF: 069928a

8 ANS:

$$7. \quad 15x + 22 \geq 120$$

$$x \geq 6.5\overline{3}$$

REF: fall0735ia

9 ANS:

$$.7d + .5 \leq 5$$

$$.7d \leq 4.5$$

$$6. \quad d \leq \frac{4.5}{.7}$$

$$d \leq 6.4$$

$$d = 6$$

REF: 080224a

10 ANS:

$$9P + 0.75(5P) \leq 75$$

$$12.75P \leq 75$$

$$5. \quad P \leq 5.9$$

$$P = 5$$

REF: 010938a

11 ANS:

$$2000x > 500000 + 550x$$

$$345. \quad 1450x > 500000$$

$$x = 345$$

REF: 010737a

12 ANS:

$$65. \quad 15x \geq 225 + 750$$

$$x \geq 65$$

REF: 080732a

13 ANS:

$$0.65x + 35 \leq 45$$

$$0.65x \leq 10$$

$$x \leq 15$$

REF: 061135ia