

**Non-Calculator Section** – Students may NOT use a calculator. All answers in this section **ONLY** must be rounded to two decimal points.

1. John has taken five tests so far this year. His test scores are listed below. What is the lowest score he could earn on the next test so that he has at least a 91% average?

89, 97, 78, 92, 93

2. a. Let  $x = 3$ ,  $y = 8$ , and  $z = -4$ , is  $\sqrt{x^2 + y^2 + z^2 + 6}$ , simplify the expression.

b. Is the expression rational or irrational?

3. An employee earns \$6.50 per hour for the first 40 hours worked in a week and \$11.45 for each hour of overtime. One week's paycheck is \$374.50.

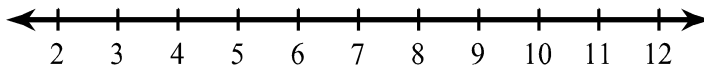
a. Write an equation to represent the situation.

b. Solve the equation to determine how many hours of overtime the employee worked.

4. Use the inequality  $-2x + 14 \leq -4$ .

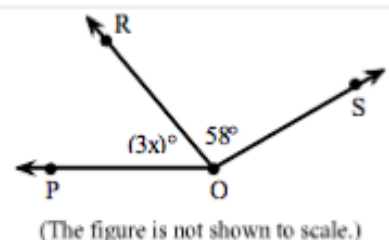
a. Solve the inequality.

b. Graph the inequality.

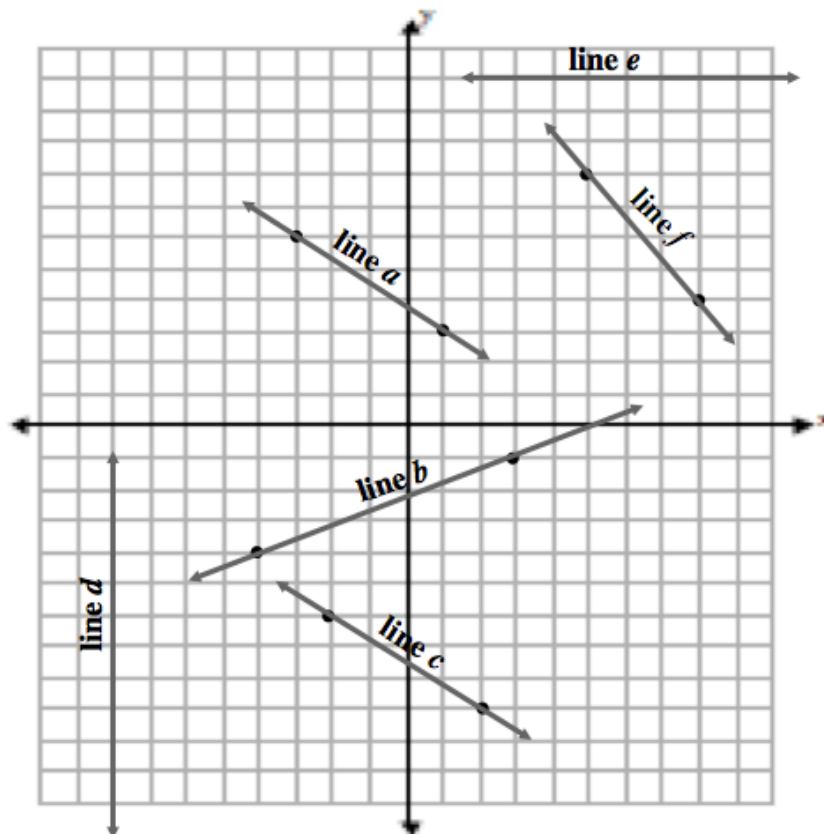


5. At the end of 2015, the population of City A was 570,000 and the population of City B was  $5.7 \times 10^4$ . Which city had the greater population?

6. The measure of  $\angle POS$  is  $112^\circ$ . What is the value of  $x$ ?



7. Two athletes are training over a two-week period to increase the number of pull-ups they can do. Athlete A can do 12 pull-ups to start and increased his total by 3 pull-ups a week. Athlete B can do 9 pull-ups to start and increases his total by 4 pull-ups a week. Write equations to represent how many pull-ups,  $T$ , each athlete can do in a given number of weeks,  $w$ .
8. Your friend commutes  $\frac{9}{10}$  miles to school. You commute 3 miles to school. Write the ratio of your friend's commute to your commute as a fraction in simplest form.
9. A recipe for lemonade calls for  $1\frac{2}{3}$  cups of water for each cup of concentrate. You use  $3\frac{4}{5}$  cups of concentrate. How much water should you use? Express your answer as an improper fraction in simplest form.
10. Using the graph below, identify the two lines that are parallel. What is the slope of these lines?

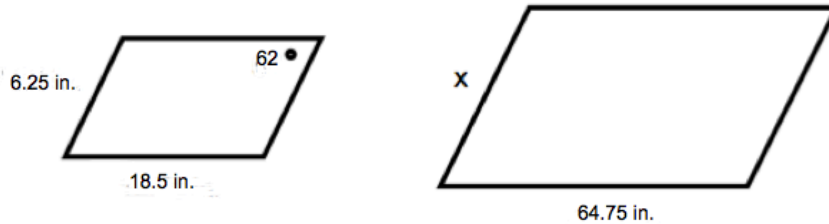




16. A store had apples on sale for \$2.65 a pound. Jane spent \$8.75 on apples. How many pounds of apples did Jane buy? Round to the nearest tenth.

17. A flagpole 8 meters tall casts a 12-meter shadow. At the same time of day a nearby building casts an 84-meter shadow. How tall is the building?

18. Use the diagram provided and the fact that the shapes are similar to solve for the value of  $x$ .  
(Note: Figures are not drawn to scale)



19. On a map, the distance from City A to City B is 3 inches apart which represents a distance of 93 miles. City A is 1.8 inches from City C on the map. How far apart are City A and City C?

20. A student answers 90% of the questions on a math exam correctly. If she answers 18 questions correctly, how many questions are on the exam?

\*\*\*\*\* END OF CONTEST \*\*\*\*\*