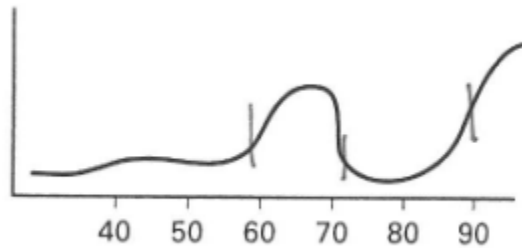




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Example 3: The following graph shows the distribution of test scores on an Algebra Exam.

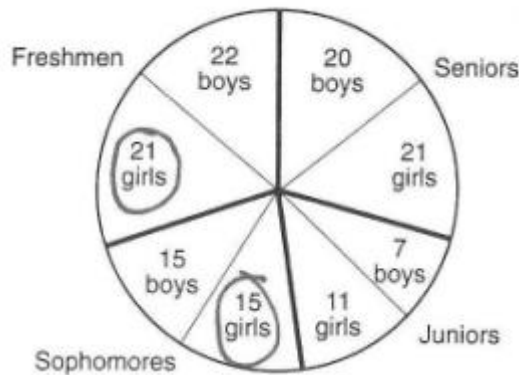


Which of the following statements do you know to be true?

- I. The majority of students scored higher than 60?
- II. The test was a fair measure of ability.
- III. The mean score is probably higher than the median.
- IV. The test divided the class into distinct groups.

- a) I and II only      b) I and IV only      c) I, III, and IV only      d) IV only

Example 4: The distribution of a high school chorus is depicted in the graph below. There is a total of 132 students in the chorus.

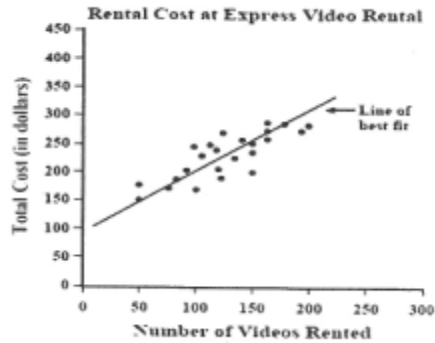


Which of the following expression represents the percentage of freshman and sophomore girls in chorus?

- a)  $\frac{21+15}{132} \times 100$       b)  $\frac{21+15}{132} + 100$       c)  $\frac{21+15}{132}$       d)  $\frac{21+15}{132} \times 132$

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Example 5: Using the line of best fit shown on the scatterplot below, which of the following best approximates the rental cost per video to rent 300 videos?



a) \$3.00

b) \$2.50

c) \$2.00

d) \$1.50

Example 6: The table below shows the number of visitors to a natural history museum during a 4-day period.

Day	Number of Visitors
Friday	597
Saturday	1115
Sunday	1346
Monday	365

Which expression would give the BEST estimate of the total number of visitors during this period?

a)  $500 + 1100 + 1300 + 300$

b)  $600 + 1100 + 1300 + 100$

c)  $600 + 1100 + 1300 + 400$

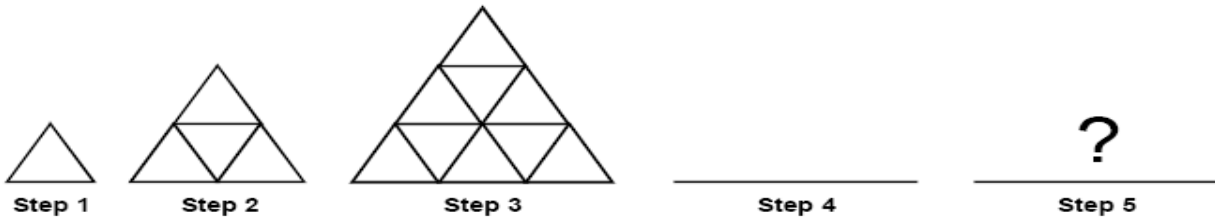
d)  $600 + 1100 + 1400 + 400$

**APPLY MATHEMATICAL REASONING SKILLS TO ANALYZE PATTERNS AND SOLVE PROBLEMS - 0010**

- Draw conclusions using inductive reasoning and deductive reasoning.

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Example 7: Use the diagram below to answer the question that follows.



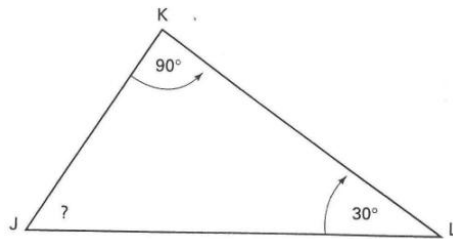
If the sequence above continues in the same pattern, how many small triangles would be needed to make the figure that would occur in Step 5?

- a) 16                      b) 25                      c) 36                      d) 49

Example 8: Find the next term in the following non-arithmetic sequence:  $\frac{3}{1}, \frac{5}{3}, \frac{7}{5}, \dots$

- a)  $\frac{11}{9}$                       b)  $\frac{7}{1}$                       c)  $\frac{9}{7}$                       d)  $\frac{5}{7}$

Example 9: Find the measure of  $\angle J$ .



- a)  $120^\circ$                       b)  $30^\circ$                       c)  $60^\circ$                       d)  $180^\circ$

Example 10: When a student is questioned about his school, he replies that there are at least as many freshmen as there are juniors and at least as many juniors as there are sophomores. If the student is correct, which of the following statements must be true?

- a) There are just as many sophomores as there are freshmen.
- b) There are at least as many sophomores as there are freshmen.
- c) There are at least as many freshmen as there are sophomores.
- d) There are more freshman than there are sophomores.

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Example 11: Which of the following statements is logically equivalent to "If it is Saturday, then I am not in school."

- a) If I am not in school, then it is Saturday.
- b) If it is not Saturday, then I am not in school.
- c) If I am in school, then it is not Saturday.
- d) If it is Saturday, then I am in school.

**WORD PROBLEMS AND ALGEBRAIC METHODS - COMPETENCY 0011**

- Apply combinations of algebraic skills to solve problems.
- Identify the algebraic equivalent of a stated relationship.
- Identify the proper equation or expression to solve word problems involving one and two variables.

Example 12: Katie babysat for the Wilsons one evening. They paid her \$5 just for coming over to their house, plus \$7 for every hour of sitting. How much was she paid if she babysat for 4 hours?

- a) \$12
- b) \$35
- c) \$28
- d) \$33

Example 13: Which equation could be used to solve the following problem? "Three consecutive odd numbers add up to 93. What are they?"

- a)  $x + x + x = 93$
- b)  $x + (x + 2) + (x + 4) = 93$
- c)  $x + 3x + 5x = 93$
- d)  $x + (x + 1) + (x + 3) = 93$

Example 14: On a trip to the planetarium, Darren's ticket cost \$18.97. Altogether, Darren spent a total of \$53.21. To find how much he spent on items other than his ticket, solve this equation for  $x$ .

- a) \$72.18
- b) \$34.24
- c) \$15.27
- d) \$30.00

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Example 15: Four students about to purchase concert tickets for \$18.50 for each ticket discover that they may purchase a block of 5 tickets for \$80.00. How much would each of the 4 save if they can get a fifth person to join them and the 5 people equally divide the price of the 5-ticket block?

- a) \$1.50                      b) \$2.50                      c) \$3.13                      d) 12.50

Example 16: An airplane flew by 8 hours at an airspeed of  $x$  miles per hour (mph), and for 7 more hours at 325 mph. If the average airspeed for the entire flight was 350 mph, which of the following equations could be used to find  $x$ ?

- a)  $x + 325 = 2(350)$   
b)  $x + 7(325) = 15(350)$   
c)  $8x + 7(325) = 2(350)$   
d)  $8x + 7(325) = 15(350)$

Example 17: Which equation could be used to solve the following problem? "The sum of three consecutive integers equals 132."

- a)  $x + x + x = 132$   
b)  $x + (x + 2) + (x + 4) = 132$   
c)  $x + 2x + 3x = 132$   
d)  $x + (x + 1) + (x + 2) = 132$

Example 18: Mark tried to compute the average of his 7 exam scores. He mistakenly divided the correct sum of all of his exam scores by 6, which yielded 84. What is Mark's correct average exam score?

- a) 70                      b) 72                      c) 84                      d) 92

**COMPUTATION SKILLS BASIC NUMBER SKILLS - COMPETENCY 0012**

- Solve word problems involving integers, fractions, decimals, and percentages.
- Solve word problems involving ratio and proportions.
- Solve word problems involving units of measurement and conversions.

Example 19: In scientific notation,  $20,000 + 3,400,00 = ?$

- a)  $3.42 \times 10^6$                       b)  $3.60 \times 10^6$                       c)  $3.42 \times 10^7$                       d)  $3.60 \times 10^7$

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Example 20: Mr. Brown went grocery shopping to buy meat for his annual office picnic. He bought  $7\frac{3}{4}$  pounds of hamburger, 17.85 pounds of chicken, and  $6\frac{1}{2}$  pounds of hot dogs. How many pounds of meat did Mr. Brown buy?

- a) 32.10                      b) 31.31                      c) 26.25                      d) 22.10

Example 21: On a math test, 12 students earned an A. This number is exactly 25% of the total number of students in the class. How many students are in the class?

- a) 15                              b) 21                              c) 30                              d) 48

Example 22: Which of the following fractions is equivalent to 28%?

- a)  $\frac{1}{5}$                               b)  $\frac{7}{25}$                               c)  $\frac{1}{4}$                               d)  $\frac{5}{6}$

Example 23: One day, 22 students were absent from Tonkawa Elementary School. If that represents about 4.4% of the students, what is the population of the school?

- a) 477                              b) 500                              c) 96.8                              d) 88

Example 24: The maximum speed limit on the interstate is 70mph. The minimum speed limit on the interstate is 40mph. Which inequality describes the allowable speeds indicated by the speed limits.

- a)  $75 \leq x \leq 40$                       b)  $75 < x > 40$                       c)  $40 \leq x \leq 75$                       d)  $40 < x > 75$

Example 25: Which of the following proportions will not give the same value for x as the proportion  $\frac{9}{19} = \frac{x}{22}$ ?

- a)  $\frac{22}{19} = \frac{x}{9}$                       b)  $\frac{x}{19} = \frac{22}{9}$                       c)  $\frac{x}{22} = \frac{9}{19}$                       d)  $\frac{19}{22} = \frac{9}{x}$

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Example 26: A store owner buys a computer for \$620. If she sells the computer for 40% more than she paid for it, what is the computer's final price?

- a) \$635                      b) \$660                      c) \$775                      d) \$868

Example 27: A school district would like to decrease the size of its kindergarten classes from 32 to 20 students. What percent decrease would this represent?

- a) 23.5                      b) 31.5                      c) 37.5                      d) 42.5

**GRAPHING AND SOLVING EQUATIONS - COMPETENCY 0013**

- Graph numbers or number relationships.
- Find the value of the unknown in a given one-variable equation.
- Express one variable in terms of a second variable in two-variable equations.

Example 28: If  $6b + 20 = a$ , and  $4b + 30 = a$ , then  $b =$

- a) -5                      b) -1                      c) 1                      d) 5

Example 29: Solve the following equation  $5 + 2(x - 3) = x - 14$  for  $x$ .

- a) -7                      b) 13                      c) 10                      d) -9

Example 30: If  $2(x - 5) = -11$ , then  $x = ?$

- a)  $-21/2$                       b) -8                      c)  $-11/2$                       d)  $-1/2$

Example 31: Solve the following equation  $4x - 2y = 10$  for  $y$ .

- a)  $y = -4x + 10$                       b)  $y = 2x + 5$                       c)  $y = 2x - 5$                       d)  $y = 4x - 10$



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Example 32: Which of the following is a factor of the polynomial  $x^2 - x - 20$ ?

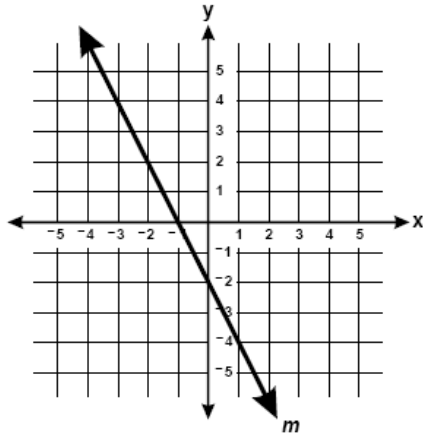
a)  $x - 5$

b)  $x - 4$

c)  $x + 2$

d)  $x + 5$

Example 33: Which point lies on the line  $m$ ?



a)  $(-1, 1)$

b)  $(1, -4)$

c)  $(-3, -4)$

d)  $(2, -2)$

Example 34: The following table below shows values for  $x$  and corresponding values for  $y$ .

$x$	$y$
21	3
14	2
28	4
7	1

a)  $y = 1/7x$

b)  $y = 7x$

c)  $y = x - 6$

d)  $y = x - 18$

Example 35: What is the slope of the line with the equation  $2x + 3y = -6$ ?

a)  $-2/3$

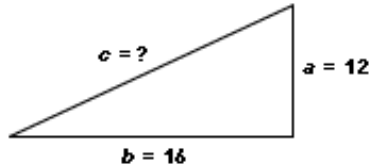
b)  $-3$

c)  $-2$

d)  $-6$

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Example 36: If  $a = 12$  and  $b = 16$ , use the Pythagorean Theorem to find  $c$ , the length of the hypotenuse of the right triangle shown below.



a) 14

b) 20

c) 400

d) 144

**GEOMETRY- COMPETENCY 0014**

- Solve problems involving geometric figures - Perimeter, Area, Volume, and Surface Area

Example 37: A circular area rug has a circumference of  $26\pi$  inches. What is the radius of the rug?

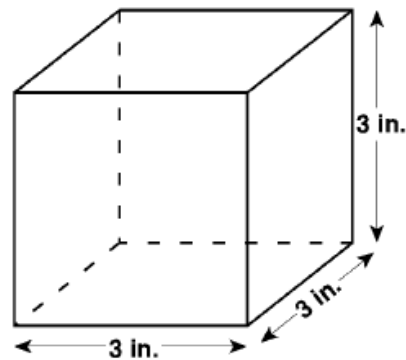
a)  $\sqrt{26}$  inches

b) 13 inches

c) 26 inches

d) 39 inches

Example 38: A company makes boxes that have the shape of a cube measuring 3 inches on each edge. What is the surface area of each box?



a) 9 square in.

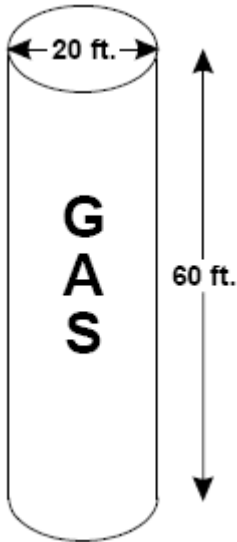
b) 27 square in.

c) 54 square in.

d) 81 square in.

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Example 39: D&J company estimates that it will cost \$2.00 per square foot to paint the gas tank. Which of the following expressions could be used to determine the total cost to paint the top and the side of the tank?



a)  $(1200\pi + 100\pi)(2.00)$

b)  $\frac{1200\pi + 100\pi}{2.00}$

c)  $(1200\pi + 200\pi)(2.00)$

d)  $\frac{1200\pi + 200\pi}{2.00}$

Example 40: Find the surface area and volume of the rectangular prism shown in the figure below.

