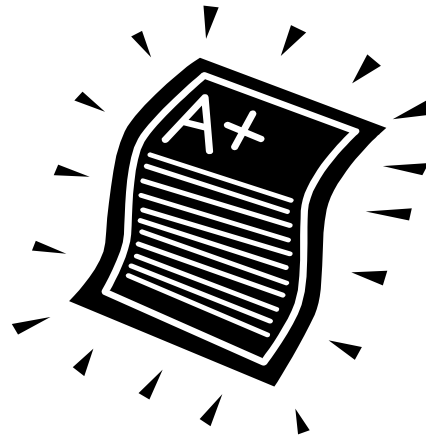


12th Grade Mathematics Assessment

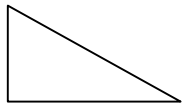
Name: _____
Date: _____
School: _____
District: _____



*Increasing Achievement for Schools,
Teachers, & Students*

Mathematics Reference Sheet

Area



Triangle

$$A = \frac{1}{2}bh$$



Rectangle

$$A = lw$$



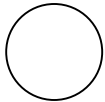
Trapezoid

$$A = \frac{1}{2}h(b_1 + b_2)$$



Parallelogram

$$A = bh$$



Circle

$$A = \pi r^2$$

Key

b = base

h = height

l = length

w = width

ℓ = slant height

$S.A.$ = surface area

d = diameter

r = radius

A = area

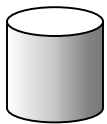
C = circumference

V = volume

Use 3.14 or $\frac{22}{7}$ for π .

Circumference

$$C = \pi d = 2\pi r$$



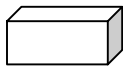
Right Circular Cylinder

Volume

$$V = \pi r^2 h$$

Total Surface Area

$$S.A. = 2\pi r h + 2\pi r^2$$



Rectangular Solid

$$V = lwh$$

$$S.A. = 2(lw) + 2(hw) + 2(lh)$$



Sphere

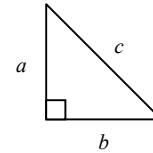
$$V = \frac{4}{3}\pi r^3$$

$$S.A. = 4\pi r^2$$

In a polygon, the sum of the measures of the interior angles is equal to $180(n - 2)$, with n representing the number of sides.

In a regular polygon, the measure of an interior angle is equal to $\frac{180(n - 2)}{n}$.

Pythagorean theorem: $c^2 = a^2 + b^2$



$$y = mx + b$$

Slope-intercept form of an equation of a line, where $m = \text{slope}$ and $b = \text{the } y\text{-intercept}$.

$$d = rt$$

Distance, rate, time formula, where $d = \text{distance}$, $r = \text{rate}$, $t = \text{time}$.

$$I = prt$$

Simple interest formula, where $p = \text{principal}$, $r = \text{rate}$, $t = \text{time}$.

Conversions

1 yard = 3 feet = 36 inches

1 mile = 1,760 yards = 5,280 feet

1 acre = 43,560 square feet

1 hour = 60 minutes

1 minute = 60 seconds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 liter = 1000 milliliters = 1000 cubic centimeters

1 meter = 100 centimeters = 1000 millimeters

1 kilometer = 1000 meters

1 gram = 1000 milligrams

1 kilogram = 1000 grams

1 pound = 16 ounces

1 ton = 2,000 pounds

Begin with Question #45 on Your Answer Sheet for the Math Portion of the Assessment.

45. What is the next number in the sequence? $\frac{1}{5}, \frac{3}{10}, \frac{2}{5}, \frac{1}{2}, ?$

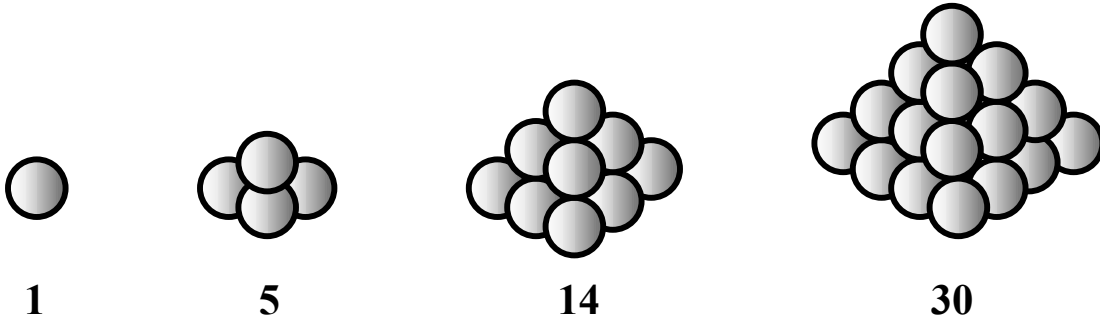
A. $\frac{3}{11}$

B. $\frac{3}{5}$

C. 1

D. 5

One method for stacking cannonballs is to form a pyramid. The first **THREE** such pyramids are shown below.



46. If the pattern above continues, how many cannonballs will be in the **EIGHTH** pile?
- A. 55 cannonballs
 - B. 140 cannonballs
 - C. 204 cannonballs
 - D. 285 cannonballs

47. Evaluate $\frac{3}{4}x^2 - 2x + 1$ with $x = -4$.

- A. -3
- B. 5
- C. 21
- D. 12

48. Multiply: $(2x + 3)(3x - 4)$

- A. $6x^2 + x - 12$
- B. $5x - 1$
- C. $6x + 12$
- D. $6x^2 - 12$

49. Mrs. James has 28 students in her 3rd period algebra class. 12 of those students are girls, and 16 are boys. What is the ratio of girls to boys?

- A. 3 to 7
- B. 4 to 7
- C. 16 to 12
- D. 3 to 4

50. A club consists of 12 members. In how many ways can the club elect a president, vice-president, and secretary?
- A. 220
 - B. 36
 - C. 1,320
 - D. 12
51. If you roll a six-sided die numbered one through six and toss a quarter simultaneously, what is the probability of landing on a five on the die and heads on the quarter?
- A. $\frac{1}{12}$
 - B. $\frac{1}{6}$
 - C. $\frac{1}{4}$
 - D. $\frac{5}{6}$
52. How would you solve the following problem? *“How many different meals can Jamal create from four entrees, three side dishes, and two desserts if his meal consists of one entrée, one side dish, and one dessert?”*
- A. $4 + 3 + 2 =$
 - B. $4!3!2! =$
 - C. $4 \cdot 3 \cdot 2 =$
 - D. $2(4 + 3 + 2) =$



53. Which pair of words shows a 180° clockwise rotation of the original?

A. **BALL**
B
A
L
L

B. **LLABBALL**


C. **LLABALL**

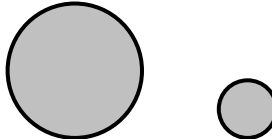
D. **BALLBALL**

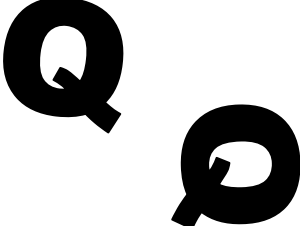
54. How many edges does a box have?

- A. 6 edges
- B. 12 edges
- C. 16 edges
- D. 18 edges

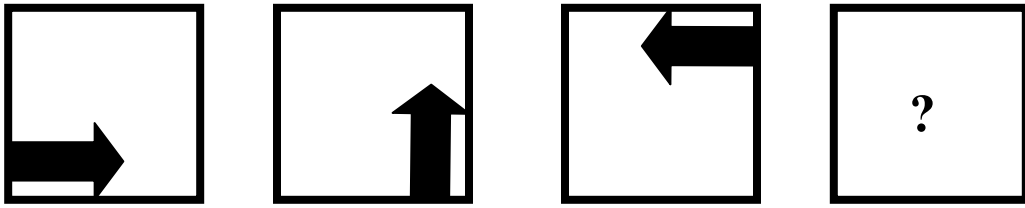
55. Which of the following is a translation of the original?

A. 

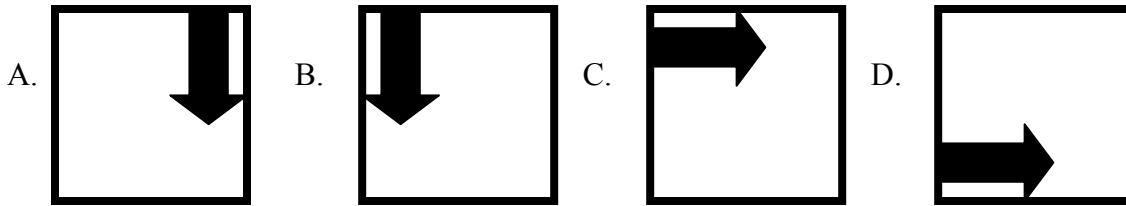
B. 

C. 

D. 



56. Which should come next in the geometric pattern above?



57. If one mile is approximately 1609.345 meters, approximately how many kilometers is one mile?

- A. 1.609345
- B. 1609345
- C. 160934.5
- D. 16093.45

58. A chef finds a recipe that requires five cups of flour to feed 100 people. If he wants to feed 25 people, how many cups of flour should he use?

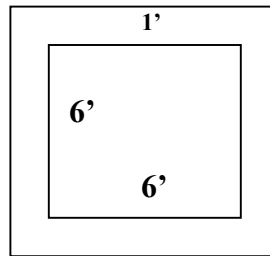
- A. $1\frac{1}{3}$ cups
- B. 4 cups
- C. $1\frac{1}{2}$ cups
- D. $1\frac{1}{4}$ cups



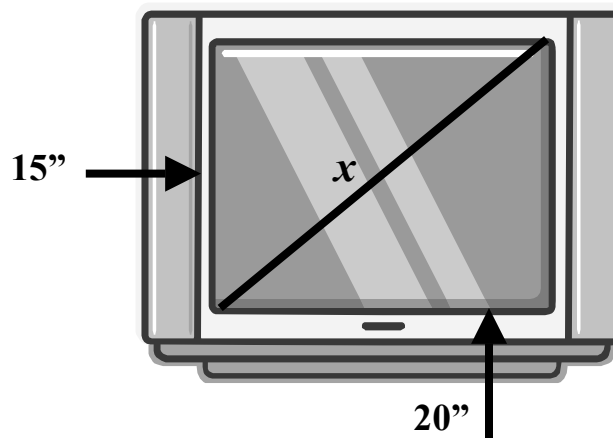
59. William is driving to his grandmother's house for winter break. His grandmother's house is 370 miles from his house. Because William has to travel through several different cities, his average rate of speed will only be 50 mph. How long will it take William to get to his grandmother's house?
- A. 18.5 hours
 - B. 4.7 hours
 - C. 5.8 hours
 - D. 7.4 hours

60. The figure below shows a hot tub surrounded by square border tiles. If the hot tub is 6 ft by 6 ft, and the border tiles measure 1 foot on each side, how many tiles are needed for the border?

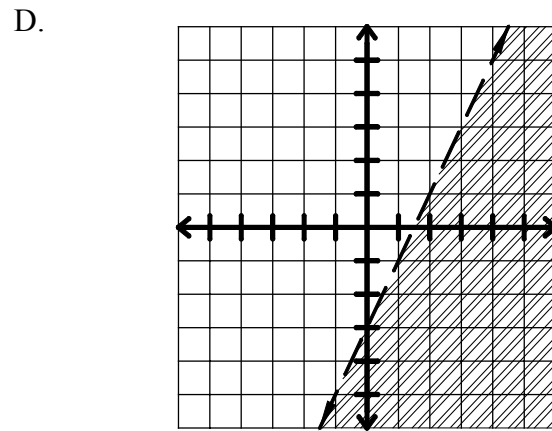
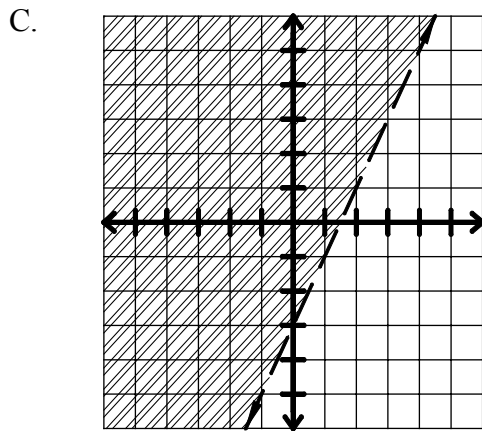
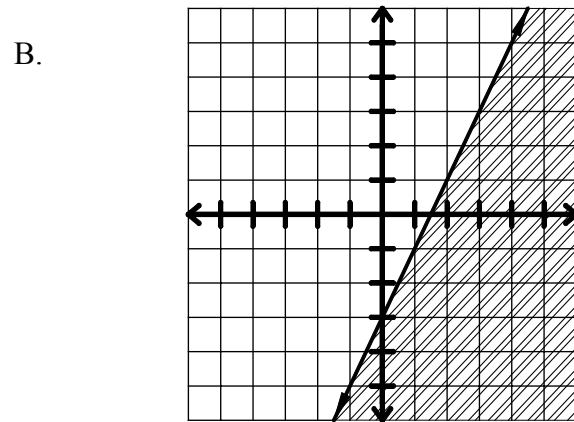
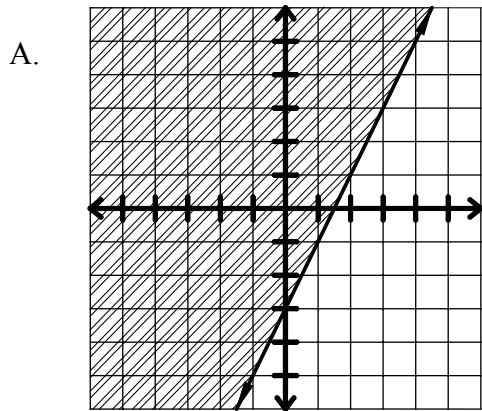
- A. 36 tiles
- B. 24 tiles
- C. 28 tiles
- D. 40 tiles



61. A television screen measures 15'' by 20.'' What is the length of its diagonal?
- A. 35''
 - B. 25''
 - C. 17.5''
 - D. 21''



62. Which graph represents the inequality $2x - y > 3$?



63. The distance from the Earth to the sun is approximately 149000000000 meters.
Express this number in scientific notation.

- A. $1.49 \cdot 10^{11}$
- B. $14.9 \cdot 10^{10}$
- C. $149 \cdot 10^9$
- D. $1490 \cdot 10^8$

64. Which of the follow is closest to $12\sqrt{7}$?

- A. $31\frac{1}{4}$
- B. 84
- C. $31\frac{3}{4}$
- D. $31\frac{1}{2}$

65. Which represents a number that, when squared, will result in a number less than itself?

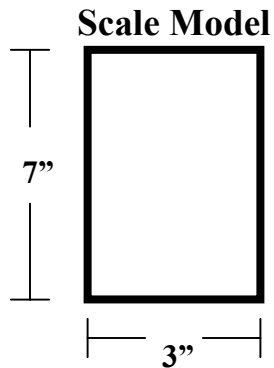
- A. -2
- B. -1
- C. 2
- D. $\frac{3}{4}$

66. Place the following numbers in order from **greatest** to **least**.

$$-3.4, \sqrt{2}, |-4|, 0, -\sqrt{10}$$

- A. $|-4|, -3.4, -\sqrt{10}, 0, \sqrt{2}$
- B. $-3.4, -\sqrt{10}, 0, \sqrt{2}, |-4|$
- C. $|-4|, \sqrt{2}, 0, -\sqrt{10}, -3.4$
- D. $\sqrt{2}, 0, -\sqrt{10}, -3.4, |-4|$

Jenni is designing her luxury shower for the master bathroom in her new house. She drew a scale model of the shower that has a length of 3 inches and a width of 7 inches.

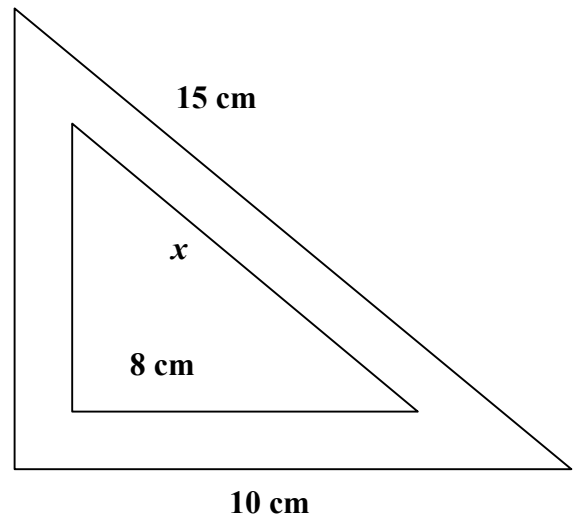


67. If the length of the shower will be 6 feet, what will be the width of the full-size shower unit in **feet**? (Use the scale model to help you determine your answer).

- A. 7 feet
- B. 14 feet
- C. 10 feet
- D. none of the above

68. What is the value of x in the triangle shown below?

- A. 12 cm
- B. 13 cm
- C. 17 cm
- D. 14 cm



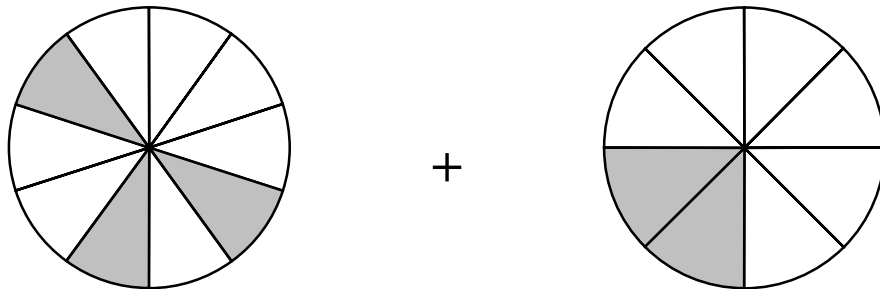
69. Mercury, Venus, and Earth revolve around the sun once every 3, 7, and 12 months, respectively. If the three planets are now in the same straight line, what is the least number of months that must pass before the planets line up again?

- A. 252 months
- B. 84 months
- C. 21 months
- D. 12 months

70. Denita is making cookies for a bake sale. She is making two kinds of cookies. To make a batch of sugar cookies, she needs ten cups of sugar and eight cups of flour. To make a batch of chocolate melts, she needs four cups of sugar and six cups of flour. Denita has 120 cups of sugar and 120 cups of flour. She wants to make the **maximum** number of batches without having to buy more sugar or flour. How many batches of each cookie can she make?

- A. 10 batches of sugar cookies and 5 batches of chocolate melts
- B. 9 batches of sugar cookies and 7 batches of chocolate melts
- C. 8 batches of sugar cookies and 9 batches of chocolate melts
- D. 7 batches of sugar cookies and 11 batches of chocolate melts

71. The outer perimeter of a picture frame needs to be at least 102 centimeters. If the length of the frame is 4 centimeters longer than the width, what is the least possible integer value for the **length** of the frame?
- A. 21 cm
 - B. 23.5 cm
 - C. 19 cm
 - D. none of the above



72. Shawndell had a 3-tiered chocolate groom's cake that was served at his wedding reception. The two tiers shown above were separated by columns, and both had a diameter of 10 inches. A few pieces of the 2 cakes were not eaten, which is reflected by the shaded areas. How much cake was leftover from these 2 cakes?

- A. $\frac{4}{17}$
- B. $\frac{1}{8}$
- C. $\frac{2}{7}$
- D. $\frac{11}{20}$

73. Divide: $\frac{4}{11} \div 6$

- A. $2\frac{3}{11}$
- B. $16\frac{1}{2}$
- C. $\frac{2}{33}$
- D. 16

74. Which list is the correct order of operations to simplify the following expression?

$$18 \div 2 (7 + 3) - 5 =$$

- A. add, multiply, divide, subtract
- B. add, multiply, subtract, divide
- C. add, divide, multiply, subtract
- D. divide, add, multiply, subtract

75. Simplify: $2 [4 (2^3 - 5) + 8] \div 4 - 2 =$

- A. 20
- B. 36
- C. 10
- D. 8

76. Which is the inverse operation of $75 - n = 100$?

- A. $n + 100 = 75$
- B. $75 + 100 = n$
- C. $100 - n = 75$
- D. none of the above

From 1951 to 1968, Mickey Mantle played for the New York Yankees. The table below gives the number of homeruns he hit each year between 1951 and 1958. Use it to answer the follow three questions.

<i>YEAR</i>	<i>HOMERUNS</i>
1951	13
1952	23
1953	21
1954	27
1955	37
1956	52
1957	34
1958	42

77. What was the median number of homeruns Mickey Mantle hit during this period?

- A. 31
- B. 30
- C. 30.5
- D. 31.13

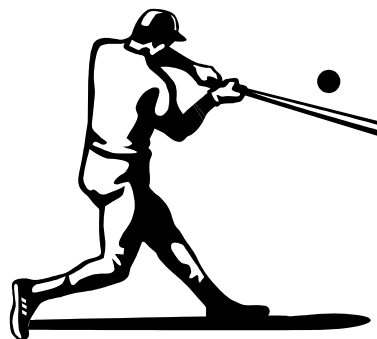
<i>YEAR</i>	<i>HOMERUNS</i>
1951	13
1952	23
1953	21
1954	27
1955	37
1956	52
1957	34
1958	42

78. What was the mean number of homeruns Mickey Mantle hit during this period?

- A. 31.13
- B. 31
- C. 30.5
- D. 30

79. Which of these expressions represents the average rate of change in the number of homeruns hit per year between 1951 and 1958?

- A. $\frac{1958 - 1951}{13 - 52}$
- B. $\frac{1958 - 1951}{42 - 13}$
- C. $\frac{1958 - 52}{1951 - 13}$
- D. $\frac{42 - 13}{1958 - 1951}$



The table below shows the life expectancy at birth for white males and white females.

BIRTH YEAR	MALE	FEMALE
1920	54.4	55.6
1930	59.7	63.5
1940	62.1	66.6
1950	66.5	72.2
1955	67.4	73.7
1960	67.4	74.1
1965	67.6	74.7
1970	68.0	75.6
1971	68.3	75.8
1972	68.3	75.9
1973	68.4	76.1
1974	68.9	76.6
1975	69.4	77.2
1976	69.7	77.3
1977	70.0	77.7
1978	70.2	77.8
1979	70.6	78.3

80. Which of these expressions represents the average rate of change in female life expectancy per year between 1920 and 1979?

A. $\frac{1979 - 1920}{78.3 - 55.6}$

B. $\frac{78.3 - 55.6}{1979 - 1920}$

C. $\frac{70.6 - 54.4}{1979 - 1920}$

D. $\frac{1979 - 1920}{70.6 - 54.4}$

