Good Luck to Key Date _____ Pd ____

**ACT Mid-TEST: 9th Graders**

*Since there are 15 questions you get 20 minutes. Do your best! Place the CAPITAL LETTER in the box provided.*

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**2** △ △ △ △ △ △ △ △ △ **2**

**MATHEMATICS TEST**

*60 Minutes—60 Questions*

**DIRECTIONS:** Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

Do not linger over problems that take too much time. Solve as many as you can; then return to the others in the time you have left for this test.

You are permitted to use a calculator on this test. You may use your calculator for any problems you choose, but some of the problems may best be done without using a calculator.

Note: Unless otherwise stated, all of the following should be assumed.

1. Illustrative figures are NOT necessarily drawn to scale.
2. Geometric figures lie in a plane.
3. The word *line* indicates a straight line.
4. The word *average* indicates arithmetic mean.

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1. In scientific notation, 670,000,000 + 700,000,000 = ?

D

A. $1.37 \times 10^{-9}$
B. $1.37 \times 10^{7}$
C. $1.37 \times 10^{8}$
(D.) $1.37 \times 10^{9}$
E. $137 \times 10^{15}$

1,370,000,000

$1.3 \times 10^{9}$

2. To make a 750-piece jigsaw puzzle more challenging, a puzzle company includes 5 extra pieces in the box along with the 750 pieces, and those 5 extra pieces do not fit anywhere in the puzzle. If you buy such a puzzle box, break the seal on the box, and immediately select 1 piece at random, what is the probability that it will be 1 of the extra pieces?

J

F. $\frac{1}{5}$
G. $\frac{1}{755}$
H. $\frac{1}{750}$
(J.) $\frac{5}{755}$
K. $\frac{5}{750}$

$\frac{\#}{\text{total}} = \frac{5}{755}$

3. What fraction lies exactly halfway between $\frac{2}{3}$ and $\frac{3}{4}$?

E

A. $\frac{3}{5}$
B. $\frac{5}{6}$
C. $\frac{7}{12}$
D. $\frac{9}{16}$
E. $\frac{17}{24}$

$\frac{2}{3} + \frac{1}{24} = \frac{17}{24}$

$\frac{3}{4} - \frac{1}{24} = \frac{17}{24}$

$\frac{3}{4} - \frac{2}{3}$

$\frac{9}{12} - \frac{8}{12} = \frac{1}{12}$ $\frac{1}{24}$

4. What is the difference between the mean and the median of the set {3, 8, 10, 15}?

F

F. 0
G. 1
H. 4
J. 9
K. 12

$\text{mean} = \frac{3+8+10+15}{4} = 9$

median = ~~3~~ 8 10 ~~15~~ = 9

5. Only tenth-, eleventh-, and twelfth-grade students attend Washington High School. The ratio of tenth graders to the school's total student population is 86:255, and the ratio of eleventh graders to the school's total student population is 18:51. If 1 student is chosen at random from the entire school, which grade is that student most likely to be in?

B

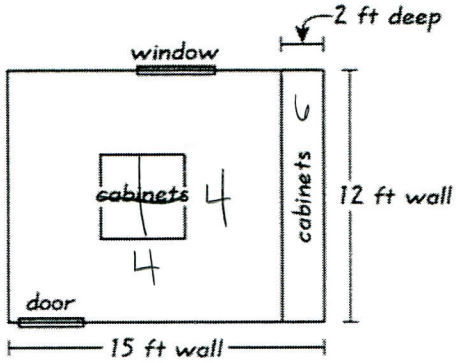
A. Tenth
B. Eleventh
C. Twelfth
D. All grades are equally likely.
E. Cannot be determined form the given information.

$10^{th} = \frac{86}{255}$ $11^{th} = \frac{18}{51} = \frac{90}{255}$

$\frac{79}{255}$

**Use the following information to answer the next 3 questions.**

Gianna is converting a 12-foot-by-15-foot room in her house to a craft room. Gianna will install tile herself but will have CC Installations build and install the cabinets. The scale drawing shown below displays the location of the cabinets in the craft room (0.25 inch represents 2 feet).




Cabinets will be installed along one of the 12-foot walls from floor to ceiling, and 4 cabinets that are each 3 feet tall will be installed in the middle of the room. These are the only cabinets that will be installed, and each of them will be 2 feet wide and 2 feet deep. CC Installations has given Gianna an estimate of $2,150.00 for building and installing the cabinets.

6. A 15-foot wall is how many inches long in the scale drawing?

F. 1.5
G. 1.875
H. 3
J. 3.375
K. 3.75

6

$\frac{15\text{ ft}}{x} = \frac{2\text{ f}}{.25}$

$3.75 = 2x$

$1.875 = x$

7. Gianna will install tile on the portion of the floor that will NOT be covered by cabinets. What is the area, in square feet, of the portion of the floor that will NOT be covered by cabinets?

A. 72
B. 90
C. 140
D. 156
E. 164

C

$(15)(12) - (2)(12) - (4)(4) =$

$180 - 24 - 16 = 140$

8. CC Installations' estimate consists of a $650.00 charge for labor, plus a fixed charge per cabinet. The labor charge and the charge per cabinet remain the same for any number of cabinets built and installed. CC Installations would give Gianna what estimate if the craft room were to have twice as many cabinets as Gianna is planning to have?

F. $2,800.00
G. $3,000.00
H. $3,450.00
J. $3,650.00
K. $4,300.00

J

$2150.00 = 650 + 10x$

$1500 = 10x$

$150 = x$

$x = 650 + 20(150) = 3650$

9. If x: y = 5:2 and y: z = 3:2, what is the ratio of x: z?

E

A. 3:1
B. 3:5
C. 5:3
D. 8:4
E. 15:4

$\frac{x}{y} = \frac{5}{2}$ $\frac{y}{z} = \frac{3}{2}$ $\frac{\frac{5y}{2}}{\frac{2y}{3}}$

$2x = 5y$ $\frac{2y}{3} = \frac{3z}{3}$ $\frac{5y}{2} \cdot \frac{3}{2y} = \frac{15y}{4y}$

10. Which of the following is the solution statement for the inequality shown below?

$-5 < 1 - 3x < 10$

H

F. $-5 < x < 10$
G. $-3 < x$
H. $-3 < x < 2$
J. $-2 < x < 3$
K. $x < -3$ OR $x > 2$

$-5 < 1 - 3x$ $1 - 3x < 10$

$-1 \quad -1$ $-1 \quad -1$

$-6 < -3x$ $-3x < 9$

$\frac{-6}{-3} < \frac{-3x}{-3}$ $\frac{-3x}{-3} < \frac{9}{-3}$

$2 > x$ $x > -3$

11. A dog eats 7 cans of food in 3 days. At this rate, how many cans of food does the dog eat in 3 + d days?

E

A. $\frac{7}{3} + d$
B. $\frac{7}{3} + \frac{d}{3}$
C. $\frac{7}{3} + \frac{7}{3d}$
D. $7 + \frac{d}{3}$
E. $7 + \frac{7d}{3}$

$\frac{7}{3} = \frac{\frac{7d}{3}}{3+d}$

12. The weekly fee for staying at the Pleasant Lake Campground is $20 per vehicle and $10 per person. Last year, weekly fees were paid for *v* vehicles and *p* persons. Which of the following expressions gives the total amount, in dollars, collected for weekly fees last year?

F

F. $20v + 10p$
G. $20p + 10v$
H. $10(v + p)$
J. $30(v + p)$
K. $10(v + p) + 20p$

$20v + 10p$

13. If r = 9, b = 5, and g = -6, what does (r + b –g) (b + g) equal?

A

A. -20
B. -8
C. 8
D. 19
E. 20

$(9 + 5 - (-6)(5 + (-6)) = -20$

14. Marlon is bowling in a tournament and has the highest average after 5 games, with scores of 210, 225, 254, 231, and 280. In order to maintain this exact average what *must* be Marlon's score for his 6th game?

J

F. 200
G. 210
H. 231
J. 240
K. 245

$\bar{X} = \frac{210+225+254+231+280}{5} = 240$

$\frac{1200 + X}{6} = 240$

$X = 1440$

15. Which of the following mathematical expressions is equivalent to the verbal expression "A number, x, squared is 39 more than the product of 10 and x"?

E

A. $2x = 39 + 10x$
B. $2x = 39x + 10x$
C. $x^2 = 39 - 10x$
D. $x^2 = 39 + x^{10}$
E. $x^2 = 39 + 10x$

$x^2 = 10x + 39$