

Math
60 Questions / 60 Minutes
31-32 Correct = 21
Problems get harder as you go!

- Look for problems that can be set up as a proportion (3-5 per test)

2. A car averages 37 miles per gallon. If gas cost \$4.04 per gallon, which of the following is closest to how much gas would cost for the car to travel 3,737 miles?

- A. \$44.40
- B. \$109.08
- C. \$118.81
- D. \$408.04
- E. \$444.44

- Know how to figure the average of a set of numbers

NOTE: ACT likes to give you a set of test scores where you can **drop the lowest score**.

Tammy has 5 test grades: 100, 90, 85, 70 and 50. The teacher drops the lowest grade. What is Tammy's average?

- Know Standard form $Ax + By = C$
- Know y-intercept form $y = mx + b$ $m = \text{slope}$ $b = \text{y-intercept}$

What is the slope of the line given by the equation $3x = 30 - 5y$?

- A. 5
- B. 3
- C. $\frac{3}{5}$
- D. $-\frac{3}{5}$
- E. -3

- Know how to convert to get to $y = mx + b$

$$x - y = 3$$

$$-y = -x + 3$$

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

$$y = x - 3$$

NOTE: ACT likes to leave you with a negative y. You must divide by a negative.

- Know parallel lines have the same slope.
- Know perpendicular lines are the opposite reciprocal

Example: $y = 3x + 10$

A parallel line will have a slope of 3

A perpendicular line will have a slope of $-1/3$

- Know Pythagorean Theorem $A^2 + B^2 = C^2$
Must have a 90 degree angle (right angle)
Hypotenuse is opposite the right angle
<https://youtu.be/AA6RfgP-AHU>
- NOTE: (Memorize 3:4:5 and 5:12:13) It will save you time!
- Know Greatest Common Factor
NOTE: Start with the largest answer. If it will divide into all the numbers, that is the correct answer.

4. What is the greatest common factor of 42, 126, and 210 ?

F. 2

G. 6

H. 14

I. 21

J. 42

- Know Probability $\frac{\text{what you are looking for}}{\text{Total}}$

There are 10 red cards, 10 yellow cards and 10 blue cards. The first three cards drawn are yellow. What is the chance of the next card drawn being yellow?

7 yellow balls

27 total balls

- Know FOIL Method (First, Outer, Inner, Last)
Example: $(2x - 3)(3x - 4)$
 $6x^2 - 8x - 9x + 12$
 $6x^2 - 17x + 12$
- Know: Perimeter = Around
Area of Rectangle = Length X Width
Area of Triangle = $\frac{1}{2}$ Base X Height
Triangles have 180 degrees internal angles
Rectangles have 360 degrees internal angles

- Know **SOH-CAH-TOA**

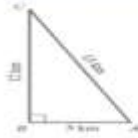
$$\text{Sine} = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\text{Cosine} = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\text{Tangent} = \frac{\text{Opposite}}{\text{Adjacent}}$$

Hypotenuse is opposite the 90 degree angle

3. Which of the following is the sine of angle A in the right triangle below?



- A. $\frac{5}{13}$
- B. $\frac{12}{13}$
- C. $\frac{12}{5}$
- D. $\frac{5}{12}$
- E. $\frac{13}{5}$

- Midpoint of two points = $\frac{X_1 + X_2}{2}$ $\frac{Y_1 + Y_2}{2}$

- Slope of two points = $\frac{Y_2 - Y_1}{X_2 - X_1}$

- Mean = average
- Median = middle
- Mode = most
- $i = \sqrt{-1}$ and $i^2 = -1$

https://youtu.be/-CmwjC_1mQA

- Circle $X^2 + Y^2 = r^2$ (0,0)
 $(x-h)^2 + (y-k)^2 = r^2$ Ex. $(x-3)^2 + (y+2)^2 = 16$ (3,-2) radius of 4
 Circumference = $(3.14)(D)$ D=diameter
 Diameter = $2(r)$ r=radius
 Area = $(3.14)r^2$ Area is always squared.

https://youtu.be/u_39J-syjB0

- Parabola
 Ax^2 is the largest value (A is positive it turns up; B is negative it turns down)
- Arithmetic Sequence $a_x = a_1 + d(x-1)$; $a_1 = 1^{\text{st}}$ term d=difference
 2, 8, 14, 20, **26, 32, 38, 44, 50, 56**
 Ex. What is the 10th number in the sequence?
 1. $a_{10} = 2 + 6(10-1)$
 2. $a_{10} = 2 + 6(9)$
 3. $a_{10} = 2 + 54$
 4. $a_{10} = 56$

- Arithmetic Sum
Alpha -> Window
2: summation

[last term]
 $\Sigma [a_1 + d(x-1)]$
 [x=1 first term]

Answer =
 $2+8+14+20+26+32+38+44+50+56 = 290$

- Exponents

$X^3 + X^3 = 2X^3$ Same base and same exponent when adding or subtracting

$$4X^2 - 3X^2 = 1X^2$$

$$(X^5)(X^3) = X^{5+3} = X^8$$

$$\frac{X^5}{X^3} = X^{5-3} = X^2$$

$$(X^3)^5 = X^{15}$$

<https://youtu.be/Zt2fdy3zrZU>

- Any number to the exponent of 0 = 1 Ex. $7^0 = 1$
- Any number to the exponent of 1 = itself Ex. $7^1 = 7$