Math ACT Slam

ACT Math Quick Facts:

1. ____ minutes to answer _____ questions.
2. Questions in the math section contain _____ answer choices.
3. The less difficult questions are at the _____ of the test, and the questions typically get more difficult throughout the test.
4. You WILL NOT be provided with any _____.

60 Minutes – 60 Questions

Algebra: 33 questions (14 Pre-Algebra, 10 Algebra 1, 9 Algebra 2)

Geometry: 23 questions (14 Plane Geometry, 9 Coordinate Geometry)

Trigonometry: 4 questions

Do not waste any time reading the directions at the beginning of the test. The directions are always the same as follows:

**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.

Working math problems and bubbling answer choices uses different part of your _____.

- Complete the problems in your book, and then bubble before your turn the page.

Make 2 passes through the questions. . .

1. On the first pass, **answer** all the ones that _____ and **guess** on all the ones you have _____how to solve.
    a. If you guess (and you cannot narrow down the answer choices), choose a letter and guess it every time.
2. **Save** the questions that you _____ for the end.

Pay attention to which questions go with a _____.

The December 2015 ACT, contained the following directions at the top of page 24:

| Use the following information to answer questions 41-44. |
|---|

However, #44 was on page 25. It is a common mistake for students overlook this and miss a question or two.

Algebra Tactics (when you don't know who to solve it):

1. Plug in your own numbers.
2. Plug in the answer choices.

**Plugging in your own numbers:**

Step 1: Plug in your own numbers for each variable. Make sure to write them down. Avoid using 0 and 1.

Step 2: Solve the problem using your numbers.

Step 3: Write down your answer and circle it. This is your TARGET.

Step 4: Plug in your chosen numbers into the answer choices. Make sure to check them all. The choice that matches your target is the correct answer.

Practice problems:

1. If a store sells a shirt for h dollars, how much would that shirt cost if it was marked down by q%?

A. hq
B. ¼ hq
C. h(1 – q/100)
D. q(1 – h/100)
E. 2hq

2. If the sum of three consecutive odd integers is p, then in term of p, what is the greatest of the three integers?

F. (p – 6)/3
G. (p – 3)/3
H. p/3
J. (p + 3)/3
K. (p + 6)/3

3. If w hats cost z dollars, then how many hats could you buy with $100?

A. 100/w
B. 100wz
C. 100w/z
D. 100z/w
E. wz

Plugging in answer choices:

Be sure to check all answers!!!

The choices are usually in numerical order, so start with C or H. Then determine if you should go up or down.

Practice Problems:

4. What is the set of real solution for $|x|^2 - |x| - 2 = 0$?

F. {2}
G. {-2, 2}
H. {-1, 2}
J. {1, 2}
K. {-2, -1, 1, 2}

5. For what real value of x, if any, is $\log_{(x+3)} (x^2 + 3) = 2$

A. -2
B. -1
C. 0
D. 1
E. There is no such value.

More Algebra Tips:

1. Use your _____ to eliminate illogical answers.
2. Take each question in _____.
3. Avoid falling into _____ (partial answers, simple math on difficult questions).
4. Understand, that on certain problems, you will be given extra information that is not _____.

Practice Problem:

6. The equation $x^2 + mx + n = 0$, m and n are integers. The only possible value for x is -3. What is the value of m?

F. 3
G. -3
H. 6
J. -6
K. 9

Geometry Tactics:

1. Use _____ when solving geometry problems.

2. Most shapes will be drawn to _____. Use your eyes to _____ impossible answer choices.

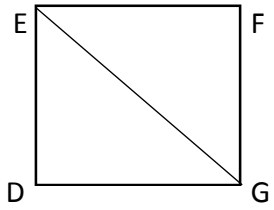
3. When a diagram is not given or not drawn to scale, _____.

4. Find any missing information in the figure _____ solving the problem.

Practice Problems:

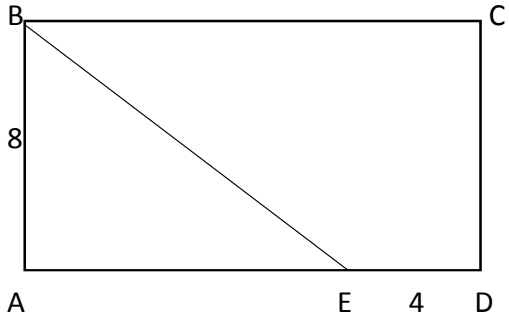
7. Figure DEFG is a square. If $\overline{EG}$ = 4, what is the area of the square?

A. 4
B. $4\sqrt{2}$
C. 8
D. 16
E. 32



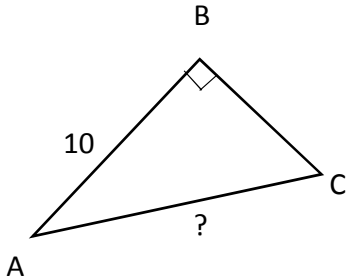

8. In the picture below, ABCD is a rectangle. If the area of Δ ABE is 40, what is the area of the rectangle?

F. 20
G. 40
H. 48
J. 80
K. 112

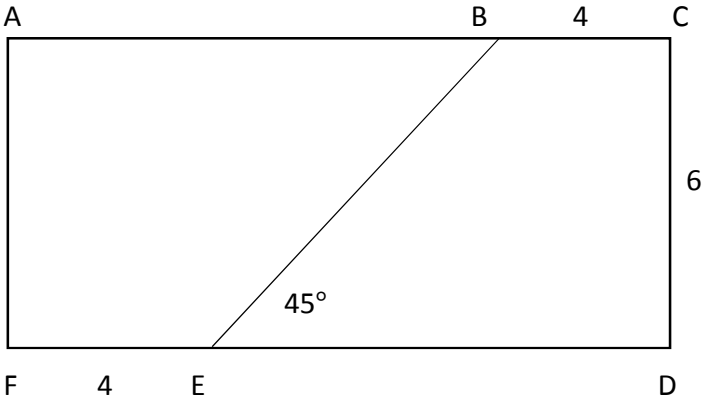



9. In triangle ABC shown below, sin C = $\frac{4}{5}$ and the length of $\overline{AB}$ is 10 inches. What is the length, in inches, of $\overline{AC}$?

A. 3
B. $\sqrt{41}$
C. 8
D. 9
E. $^{25}/_{2}$



10. As shown below, $\overline{BE}$ divides rectangle ACDF into 2 congruent trapezoids. The measure of ∠BED is 45°. The lengths of $\overline{BC}$, $\overline{CD}$, and $\overline{EF}$ are given in feet. What is the area, in square feet, of rectangle ACDF?

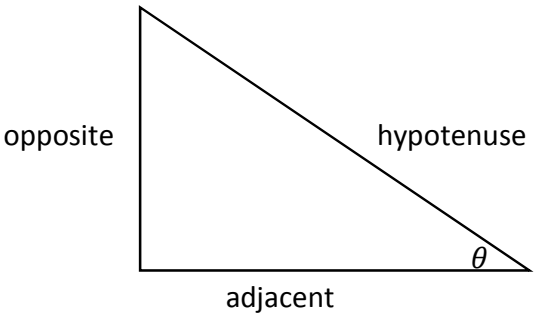



F. 10
G. 14
H. 60
J. 72
K. 84

Trigonometry Tactics:

Most of the trigonometry problems can be solved with SOH-CAH-TOA or $\mathrm{S}\frac{\mathrm{O}}{\mathrm{H}}\ \mathrm{C}\frac{\mathrm{A}}{\mathrm{H}}\ \mathrm{T}\frac{\mathrm{O}}{\mathrm{A}}$.

$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$




Opposite side is the leg across from the angle.
Adjacent is the leg touching the angle.
Hypotenuse is across form the right angle (longest).

Practice Problems:

11. For an angle with measure $\alpha$ in a right triangle, $\sin\alpha = \frac{112}{113}$ and $\tan\alpha = \frac{112}{15}$. What is the value of $\cos\alpha$?

A. $\frac{15}{113}$
B. $\frac{15}{112}$
C. $\frac{15}{\sqrt{25{,}313}}$
D. $\frac{15}{\sqrt{12{,}319}}$
E. $\frac{113}{15}$

12. Which of the following expressions gives the measure of ∠ STR?

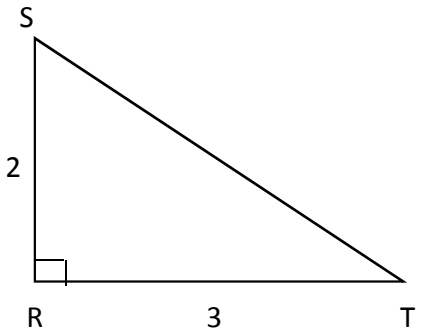
F. $\cos^{-1}\left(\frac{2}{3}\right)$

G. $\sin^{-1}\left(\frac{2}{3}\right)$

H. $\sin^{-1}\left(\frac{3}{2}\right)$

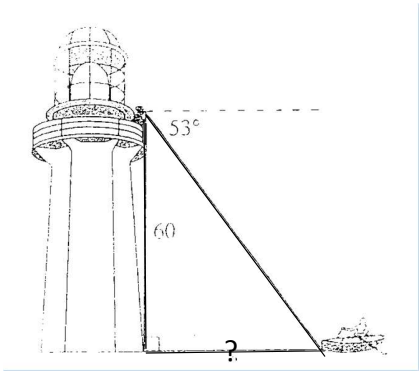
J. $\tan^{-1}\left(\frac{2}{3}\right)$

K. $\tan^{-1}\left(\frac{3}{2}\right)$




13. The figure below shows a lighthouse keeper looking down at a sailboat on the sea through a navigational instrument. The instrument is 60 feet above sea level and indicates an angle of depression of 53° to the rowboat. Which of the following is closest to the horizontal distance, in feet, between the navigational instrument and the rowboat?

A. 36
B. 45
C. 48
D. 53
E. 80




14. Given that 2 sin $a$ = 2 and 2 cos $\left(\frac{\pi}{2} - b\right) = 2$, which of the following could be a value, in radians, of $a + b$?

F. 0
G. $\frac{\pi}{2}$
H. 2
J. $\pi$
K. $2\pi$