Name:

5-a-day ACT prep #12

Solve each problem, show your work, and then choose the correct answer.

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. Which of the following expressions is **NOT** equivalent to $\frac{4x^7y^{-1}}{(5y)^2-7y^2}$?

A. $\frac{2x^7}{9y^3}$

B. $\frac{4x^7}{5y^3}$

C. $\frac{(2x^5y)^3}{36x^8y^6}$

D. $\left(\frac{2}{3}x^5y^{-5}\right)\left(\frac{1}{3}x^2y^2\right)$

E. They are all equivalent

(handwritten)
$$\frac{4x^7y^{-1}}{25y^2-7y^2} = \frac{4x^7y^{-1}}{18y^2} = \frac{2x^7}{9y^3}$$

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2. The lines represented by the equations $x + y = -3 \text{ and } x - y = 1$ intersect at the point M. What is the sum of the x and y coordinate of point M?

A. -3
B. -2
C. -1
D. 1
E. None of these

(handwritten)
$$\begin{cases} x+y=-3 \\ x-y=1 \end{cases} +$$
$$2x = -2$$
$$-1+y=-3 \Rightarrow y=-2 \qquad x=-1$$

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3. The ratio of boys to girls in Mrs. Coates' class is 3 to 5. If there are a total of 15 girls in her class, how many boys are there?

A. 9
B. 10
C. 11
D. 12
E. None of these

(handwritten)
$\frac{3 \text{ boys}}{5 \text{ girls}} \times 3 \quad \frac{9 \text{ boys}}{15 \text{ girls}}$

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4. If $9x + 4 = 3(3x + 1)$, what must be true about the solution?

A. $x = 1$
B. $x = -1$
C. $x \le 1$
D. There is no solution.
E. x can be any real number.

(handwritten)
$9x+4 = 9x+3$
$-9x \qquad -9x$
$4 \ne 3$

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5. What is the slope of a line perpendicular to the line given by the equation $3x - 2y + 10 = 0$?

A. -3
B. $-\frac{2}{3}$
C. $-\frac{1}{3}$
D. $\frac{1}{3}$
E. None of these

(handwritten)
opposite reciprocal
slope → $\frac{-3x}{-2}$
$m = \frac{3}{2}$