

ACT

Directions: Read each problem and select the best answer.

1. The expression $a[b + (c - d)]$ is equivalent to:

- A. $ab + ac - ad$
- B. $ab + ac + ad$
- C. $ab + ac - d$
- D. $ab + c + d$
- E. $ab + c - d$

2. If $4x + 3 = 9x - 4$, then $x = ?$

- F. 75
- G. 57
- H. 713
- J. 15
- K. -15

3. What 2 numbers should be placed in the blanks below so that the difference between consecutive numbers is the same?

17, _____, _____, 41

- A. 23, 29
- B. 24, 34
- C. 25, 33
- D. 26, 35
- E. 27, 31

4. If x is a real number such that $x^3 = 64$, then $x^2 + x = ?$

- F. 4
- G. 10
- H. 18
- J. 20
- K. 47

Weekly Problem 3

Prime Factor

What is the largest prime factor of 8091?

Solution

31. Write 8091 as 8100 minus 9. Recognize the difference in squares and simplify. Then, 8091 has factors 3, 3, 29, and 31. So 31 is its largest prime factor.

AIMS, ACT & Weekly Problem

Week 4

(In an effort to save space answers are highlighter in red)

AIMS:

Directions: Read each problem and select the best answer.

1. Figure EFGH has a perimeter of 40 cm and an area of 96 cm^2 . It is dilated by a factor of 14 to create a figure E'F'G'H'. What statement about the perimeter (P) and the area (A) of figure E'F'G'H' is true?

A. $P = 10 \text{ cm}; A = 6 \text{ cm}^2$
B. $P = 10 \text{ cm}; A = 24 \text{ cm}^2$
C. $P = 160 \text{ cm}; A = 192 \text{ cm}^2$
D. $P = 160 \text{ cm}; A = 384 \text{ cm}^2$

2. The area of a large square is 16 times the area of a smaller square. How many times as long is the base of the larger square than the base of the smaller square?

A. 2 times as long
B. 4 times as long
C. 8 times as long
D. 16 times as long

3. What is the distance between -4 and 3?

A. -7
B. -1
C. 1
D. 7

4. Six differently colored balls (red, blue, green, orange, purple, and white) are placed in a basket. Without looking, three balls are removed. What is the total number of combinations that include a red ball?

A. 3
B. 10
C. 20
D. 60

ACT

Directions: Read each problem and select the best answer.

1. A formula for the volume V of a sphere with radius r is $V = \frac{4}{3}\pi r^3$. If the radius of a spherical rubber ball is $1\frac{1}{4}$ inches, what is its volume to the nearest cubic inch?
A. 5
B. 7
C. 8
D. 16
E. 65
2. If a marble is randomly chosen from a bag that contains exactly 8 red marbles, and 6 white marbles, what is the probability that the marble will **NOT** be white?
F. $\frac{3}{4}$
G. $\frac{3}{5}$
H. $\frac{4}{5}$
J. $\frac{3}{10}$

K. $\frac{7}{10}$

3. The number of students participating in fall sports at a certain high school can be shown by the following matrix.

$$\begin{array}{cccc} \text{Tennis} & \text{Soccer} & \text{Cross-Country} & \text{Football} \\ [& 40 & 60 & 80 & 80 &] \end{array}$$

The athletic director estimates the ratio of the number of sports awards that will be earned to the number of students participating with the following matrix.

$$\begin{array}{l|l} \text{Tennis} & 0.3 \\ \text{Soccer} & 0.4 \\ \text{Cross-Country} & 0.2 \\ \text{Football} & 0.5 \end{array}$$

Given these matrices, what is the athletic director's estimate for the number of sports awards that will be earned for these sports?

- A. 80
- B. 88
- C. 91
- D. 92**
- E. 99

Weekly Problem 3

How many three-digit numbers consist only of odd digits?

Solution:

125. Each of the three digits can be any of the five odd digits 1, 3, 5, 7, and 9. A total of $5*5*5$; or 125, such three-digit numbers exist.