

**53** Given the equation  $P = 3Q - \frac{\sqrt{R}}{4}$ , which of the following is the correct expression for  $R$ ?

(A)  $(4P - 3Q)^2$

(B)  $(4P - 12Q)^2$

(C)  $(3PQ - 4)^2$

(D)  $(12PQ - 4)^2$

**54** What is the sum of  $(9x^2 - 2x + 3)$  and  $(-6x^2 + 8x - 13)$ , subtracted by  $(3x^2 + 10x - 20)$ ?

(F)  $-4x + 10$

(G)  $-4x - 30$

(H)  $6x^2 + 16x - 30$

(I)  $-6x^2 - 4x - 10$

**55** A Universal set  $U$  contains 20 elements. Sets  $M$  and  $N$  are subsets of  $U$ . Set  $M$  contains 8 elements, set  $N$  contains 5 elements, and set  $M \cap N$  contains no elements. How many elements are in the Cartesian product  $(\sim M \times N)$ ?

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**56** Two hot dogs and five soft drinks cost \$8.50. Five hot dogs and two soft drinks cost \$14.95. In dollars and cents, what is the cost of three hot dogs and three soft drinks?

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## Answers

**53** (B)

Multiply each term by 4 to get  $4P = 12Q - \sqrt{R}$ . Next, subtract  $12Q$  from each side to get  $4P - 12Q = -\sqrt{R}$ . Finally, square both sides to get  $(4P - 12Q)^2 = (-\sqrt{R})^2 = R$ .

**54** (F)

$(9x^2 - 2x + 3) + (-6x^2 + 8x - 13) = 3x^2 + 6x - 10$ . Then  $(3x^2 + 6x - 10) - (3x^2 + 10x - 20) = (3x^2 + 6x - 10) + (3x^2 - 10x + 20) = -4x + 10$ .

**55** The correct answer is 60. The set  $\sim M$  must contain  $20 - 8 = 12$  elements. Since set  $N$  contains 5 elements,  $(\sim M \times N)$  must contain  $(12)(5) = 60$  elements. (Note that the statement that there are no common elements to  $M$  and  $N$  does not affect the answer.)

**56** The correct answer is 10.05. Let  $x$  represent the cost of one hot dog and let  $y$  represent the cost of one soft drink. Then  $2x + 5y = 8.50$  and  $5x + 2y = 14.95$ . Adding these equations, we get  $7x + 7y = 23.45$ . Divide this equation by 7 to get  $x + y = 3.35$ . This means that the cost of one hot dog and one soft drink is \$3.35. Thus, the cost of three hot dogs and three soft drinks is  $(3)(\$3.35) = \$10.05$ .