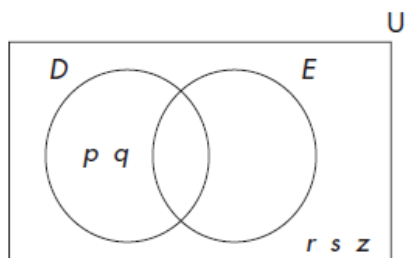


- 59 In the Venn diagram shown below for sets D and E , the Universal set U consists of the elements $p, q, r, s, t, u, v, w, x, y$, and z . (Only the elements p, q, r, s , and z are shown in their proper regions.)



If $D \cap E = \{t, w, x, y\}$, which of the following represents the set of elements that belong to exactly one of D and E ?

- (A) $\{p, q, r, s, z\}$
 (B) $\{q, s\}$
 (C) $\{p, q, u, v\}$
 (D) $\{q, s, t, u, v, w, x, y\}$
- 60 The number $\left(\frac{2^{-3} \times 5^{-1}}{2 \times 5^{-2}}\right)^4$ is simplified to the form $2^m \times 5^n$. What is the value of mn ?

--	--	--	--	--	--	--

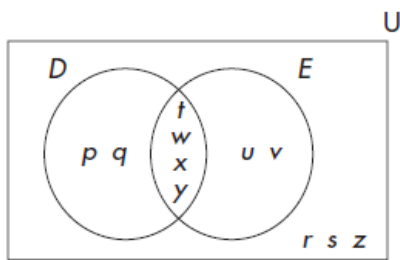
- 61 The equation of line L_1 is $x + 4y = -2$. Line L_2 is perpendicular to line L_1 . If L_2 contains the point $(5, 1)$, which of the following represents the equation of L_2 ?
- (A) $y = \frac{1}{4}x - \frac{1}{4}$
 (B) $y = -\frac{1}{4}x + \frac{9}{4}$
 (C) $y = 4x - 19$
 (D) $y = -4x + 21$

- 62 Which of the following sets contains NONE of the values of x that satisfy the inequality $-4 < 2x + 7 \leq 11$?
- (F) $\{-5, 0, 1\frac{1}{2}, 6\}$
 (G) $\{-8, -7\frac{1}{3}, 1, 2\}$
 (H) $\{-6\frac{1}{2}, -6, -5\frac{3}{4}, 2\frac{1}{5}\}$
 (I) $\{-9, -5\frac{1}{4}, 2\frac{7}{8}, 3\}$

Answers

59 (C)

There are a total of eleven elements in the Universal set. There are two elements that belong to only D , four elements that belong to both D and E , and three elements that belong to neither D nor E . This means that there are $11 - 2 - 4 - 3 = 2$ elements that belong to only E , namely u and v . Therefore, the set of elements that belong to exactly one of D and E is $\{p, q, u, v\}$. Here is the completed Venn diagram.



60 The correct answer is -64 . $\left(\frac{2^{-3} \times 5^{-1}}{2 \times 5^{-2}}\right)^4 = \frac{2^{12} \times 5^4}{2^{-4} \times 5^8} = 2^{12-(-4)} \times 5^{4-8} = 2^{16} \times 5^{-4}$. Thus, $mn = (16)(-4) = -64$.

61 (C)

Rewrite $x + 4y = -2$ in slope-intercept form. First subtract x from each side to get $4y = -x - 2$. Then divide each side by 4 to get $y = -\frac{1}{4}x - \frac{1}{2}$. Since the slope of L_1 is $-\frac{1}{4}$, the slope of a line perpendicular to L_1 must be the negative reciprocal of $-\frac{1}{4}$, which is 4. Then the equation for L_2 must be of the form $y = 4x + b$, where b is the y -intercept. Now substituting the point $(5, 1)$, we get $1 = (4)(5) + b$. Then $b = 1 - 20 = -19$. The equation for L_2 becomes $y = 4x - 19$.

62 (H)

In order to solve $-4 < 2x + 7 \leq 11$, first subtract 7 from each part. Then $-11 < 2x \leq 4$. Now divide each part by 2 to get $-5\frac{1}{2} < x \leq 2$. For answer choice (H), none of the elements satisfy $-5\frac{1}{2} < x \leq 2$. For choice (F), each of -5 , 0 , and $1\frac{1}{2}$ satisfies $-5\frac{1}{2} < x \leq 2$. For choice (G), the number 2 satisfies $-5\frac{1}{2} < x \leq 2$. For choice (I), the number $-5\frac{1}{4}$ satisfies $-5\frac{1}{2} < x \leq 2$.