A.REI.B.4: Roots of Quadratics 2a

1   Which equation has roots whose sum is 3 and whose product is −4?
   1) $x^2 + 3x - 4 = 0$
   2) $x^2 - 3x - 4 = 0$
   3) $x^2 + 4x - 3 = 0$
   4) $x^2 - 4x + 3 = 0$

2   Juan has been told to write a quadratic equation where the sum of the roots is equal to −3 and the product of the roots is equal to −9. Which equation meets these requirements?
   1) $x^2 + 3x + 9 = 0$
   2) $x^2 - 12x + 27 = 0$
   3) $2x^2 + 6x - 18 = 0$
   4) $(x + 3)(x + 9) = 0$

3   For which equation does the sum of the roots equal −3 and the product of the roots equal 2?
   1) $x^2 + 2x - 3 = 0$
   2) $x^2 - 3x + 2 = 0$
   3) $2x^2 + 6x + 4 = 0$
   4) $2x^2 - 6x + 4 = 0$

4   For which equation does the sum of the roots equal 3 and the product of the roots equal 4.5?
   1) $x^2 + 3x - 9 = 0$
   2) $x^2 - 3x + 9 = 0$
   3) $2x^2 + 6x + 9 = 0$
   4) $2x^2 - 6x + 9 = 0$

5   For which equation does the sum of the roots equal $\frac{3}{4}$ and the product of the roots equal −2?
   1) $4x^2 - 8x + 3 = 0$
   2) $4x^2 + 8x + 3 = 0$
   3) $4x^2 - 3x - 8 = 0$
   4) $4x^2 + 3x - 2 = 0$

6   Which equation has roots with the sum equal to $\frac{9}{4}$ and the product equal to $\frac{3}{4}$?
   1) $4x^2 + 9x + 3 = 0$
   2) $4x^2 + 9x - 3 = 0$
   3) $4x^2 - 9x + 3 = 0$
   4) $4x^2 - 9x - 3 = 0$

7   Which quadratic equation has roots whose sum is $-\frac{9}{4}$ and product is $\frac{2}{3}$?
   1) $12x^2 + 8x + 27 = 0$
   2) $12x^2 - 27x + 8 = 0$
   3) $12x^2 - 8x - 27 = 0$
   4) $12x^2 + 27x + 8 = 0$

8   Which quadratic equation has roots with a sum of $\frac{7}{6}$ and a product of $-\frac{1}{2}$?
   1) $6x^2 + 7x + 3 = 0$
   2) $6x^2 + 7x - 3 = 0$
   3) $6x^2 - 7x - 3 = 0$
   4) $6x^2 - 7x + 3 = 0$

9   Write a quadratic equation such that the sum of its roots is −5 and the product of its roots is 6. What are the roots of this equation?

10 Write a quadratic equation such that the sum of its roots is 6 and the product of its roots is −27.

A.REI.B.4: Roots of Quadratics 2a
Answer Section

1   ANS: 2

sum of the roots, $-\dfrac{b}{a} = -\dfrac{-3}{1} = 3$. product of the roots, $\dfrac{c}{a} = -\dfrac{-4}{1} = -4$

REF: 060820b

2   ANS: 3

sum of the roots, $-\dfrac{b}{a} = -\dfrac{6}{2} = -3$. product of the roots, $\dfrac{c}{a} = \dfrac{-18}{2} = -9$

REF: 010919b

3   ANS: 3

$\dfrac{-b}{a} = \dfrac{-6}{2} = -3$. $\dfrac{c}{a} = \dfrac{4}{2} = 2$

REF: 011121a2

4   ANS: 4   REF: 069931siii

5   ANS: 3

$S = \dfrac{-b}{a} = \dfrac{-(-3)}{4} = \dfrac{3}{4}$. $P = \dfrac{c}{a} = \dfrac{-8}{4} = -2$

REF: fall0912a2

6   ANS: 3

sum of the roots, $\dfrac{-b}{a} = \dfrac{-(-9)}{4} = \dfrac{9}{4}$. product of the roots, $\dfrac{c}{a} = \dfrac{3}{4}$

REF: 061208a2

7   ANS: 4

sum of the roots, $\dfrac{-b}{a} = \dfrac{-27}{12} = -\dfrac{9}{4}$. product of the roots, $\dfrac{c}{a} = \dfrac{8}{12} = \dfrac{2}{3}$

REF: 061627a2

8   ANS: 3

$\dfrac{-b}{a} = \dfrac{-(-7)}{6} = \dfrac{7}{6}$. $\dfrac{c}{a} = \dfrac{-3}{6} = -\dfrac{1}{2}$

REF: 011718a2

9   ANS:

$x^2 + 5x + 6 = 0$, $-3, -2$. $-\dfrac{b}{a} = -5$. $\dfrac{c}{a} = 6$. If $a = 1$, then $b = 5$ and $c = 6$. $\begin{array}{l} x^2 + 5x + 6 = 0 \\ (x+3)(x+2) = 0 \end{array}$

REF: 010830b

10 ANS:

$x^2 - 6x - 27 = 0,$ $\dfrac{-b}{a} = 6.$ $\dfrac{c}{a} = -27.$ If $a = 1$ then $b = -6$ and $c = -27$

REF: 061130a2