A.REI.B.4: Solving Quadratics 1a

1. If the domain is the set of real numbers, what is the solution set for the equation \( x^2 + 4 = 0 \)?
   1) \{-2\}
   2) \{2\}
   3) \{2, -2\}
   4) \{\}

2. What is the solution set of the equation \( 3x^2 = 48 \)?
   1) \{-2, -8\}
   2) \{2, 8\}
   3) \{4, -4\}
   4) \{4, 4\}

3. A solution of the equation \( \frac{x^2}{4} = 9 \) is
   1) 12
   2) 6
   3) 3
   4) \( \frac{3}{2} \)

4. If \( 4x^2 - 100 = 0 \), the roots of the equation are
   1) \(-25\) and 25
   2) \(-25\), only
   3) \(-5\) and 5
   4) \(-5\), only

5. What is the positive solution of the equation \( 4x^2 - 36 = 0 \)?

6. Solve the quadratic equation below for the exact values of \( x \).
   \[ 4x^2 - 5 = 75 \]

7. Which value of \( x \) is a solution to the equation \( 13 - 36x^2 = -12 \)?
   1) \( \frac{36}{25} \)
   2) \( \frac{25}{36} \)
   3) \( \frac{6}{5} \)
   4) \( \frac{5}{6} \)

8. The solution of the equation \((x + 3)^2 = 7\) is
   1) \( 3 \pm \sqrt{7} \)
   2) \( 7 \pm \sqrt{3} \)
   3) \(-3 \pm \sqrt{7} \)
   4) \(-7 \pm \sqrt{3} \)

9. A student is asked to solve the equation \( 4(3x - 1)^2 - 17 = 83 \). The student's solution to the problem starts as \( 4(3x - 1)^2 = 100 \)
   \[ (3x - 1)^2 = 25 \]
   A correct next step in the solution of the problem is
   1) \( 3x - 1 = \pm 5 \)
   2) \( 3x - 1 = \pm 25 \)
   3) \( 9x^2 - 1 = 25 \)
   4) \( 9x^2 - 6x + 1 = 5 \)

10. What is the solution of the equation \( 2(x + 2)^2 - 4 = 28 \)?
    1) 6, only
    2) 2, only
    3) 2 and \(-6\)
    4) 6 and \(-2\)

11. What are the solutions to the equation \( 3(x - 4)^2 = 27 \)?
    1) 1 and 7
    2) \(-1\) and \(-7\)
    3) \( 4 \pm \sqrt{24} \)
    4) \(-4 \pm \sqrt{24} \)

12. The height, \( H \), in feet, of an object dropped from the top of a building after \( t \) seconds is given by \( H(t) = -16t^2 + 144 \). How many feet did the object fall between one and two seconds after it was dropped? Determine, algebraically, how many seconds it will take for the object to reach the ground.
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Answer Section

1. ANS: 4
   REF: 010324siii

2. ANS: 3
   \[3x^2 = 48\]
   \[3x^2 - 48 = 0\]
   \[x^2 - 16 = 0\]
   \[(x + 4)(x - 4) = 0\]
   \[x = -4 \quad x = 4\]
   REF: 010215a

3. ANS: 2
   \[\frac{x^2}{4} = 9\]
   \[x^2 = 36\]
   \[x^2 - 36 = 0\]
   \[(x + 6)(x - 6) = 0\]
   \[x = -6 \quad x = 6\]
   REF: 010808a

4. ANS: 3
   REF: 081403ai

5. ANS:
   \[\frac{4x^2 - 36}{4} = 0\]
   \[x^2 - 9 = 0\]
   \[(x + 3)(x - 3) = 0\]
   \[x = -3 \quad x = 3\]
   REF: 080733a

6. ANS:
   \[4x^2 = 80\]
   \[x^2 = 20\]
   \[x = \pm\sqrt{20}\]
   REF: 011932ai
7 ANS: 4
\[36x^2 = 25\]
\[x^2 = \frac{25}{36}\]
\[x = \pm \frac{5}{6}\]

REF: 011715ai

8 ANS: 3

9 ANS: 1

10 ANS: 3
\[2(x + 2)^2 = 32\]
\[(x + 2)^2 = 16\]
\[x + 2 = \pm 4\]
\[x = -6, 2\]

REF: 061619ai

11 ANS: 1
\[3(x - 4)^2 = 27\]
\[(x - 4)^2 = 9\]
\[x - 4 = \pm 3\]
\[x = 1, 7\]

REF: 011814ai

12 ANS:
\[H(1) - H(2) = -16(1)^2 + 144 - (-16(2)^2 + 144) = 128 - 80 = 48\]
\[-16t^2 = -144\]
\[t^2 = 9\]
\[t = 3\]

REF: 061633ai