Name: _____

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 $\dfrac{x^2}{4} = 9$ is
   1) 12
   2) 6
   3) 3
   4) $\dfrac{3}{2}$

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

6 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) $9x^2 - 6x + 1 = 5$

7 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

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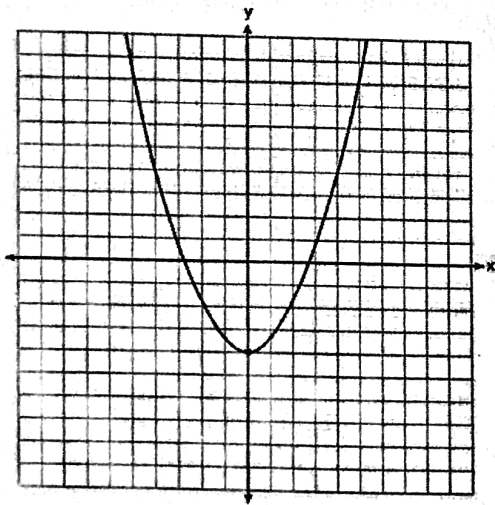   1) $3 \pm \sqrt{7}$
   2) $7 \pm \sqrt{3}$
   3) $-3 \pm \sqrt{7}$
   4) $-7 \pm \sqrt{3}$

9 What is the positive solution of the equation $4x^2 - 36 = 0$?

10 Find the zeros of $f(x) = (x-3)^2 - 49$, algebraically.

11 Ryker is given the graph of the function $y = \frac{1}{2}x^2 - 4$. He wants to find the zeros of the function, but is unable to read them exactly from the graph.

Find the zeros in simplest radical form.

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.

A.SSE.A.2: Factoring Polynomials 2

1 When factored completely, $x^3 - 13x^2 - 30x$ is
   1) $x(x+3)(x-10)$
   2) $x(x-3)(x-10)$
   3) $x(x+2)(x-15)$
   4) $x(x-2)(x+15)$

2 Factored completely, the expression
   $3x^3 - 33x^2 + 90x$ is equivalent to
   1) $3x(x^2 - 33x + 90)$
   2) $3x(x^2 - 11x + 30)$
   3) $3x(x+5)(x+6)$
   4) $3x(x-5)(x-6)$

3 Factored completely, the expression $6x - x^3 - x^2$ is
   equivalent to
   1) $x(x+3)(x-2)$
   2) $x(x-3)(x+2)$
   3) $-x(x-3)(x+2)$
   4) $-x(x+3)(x-2)$

4 Which expression is equivalent to $x^4 - 12x^2 + 36$?
   1) $(x^2 - 6)(x^2 - 6)$
   2) $(x^2 + 6)(x^2 + 6)$
   3) $(6 - x^2)(6 + x^2)$
   4) $(x^2 + 6)(x^2 - 6)$

5 Factor: $x^3 + 8x^2 + 7x$

6 Factor: $a^3 - 3a^2 - 10a$

7 Factor completely: $x^3 - x^2 - 6x$

8 Factor completely: $5x^3 - 20x^2 - 60x$

Name: _____

A.REI.A.2: Solving Radicals 4

1   Solve for all values of q that satisfy the equation
    $\sqrt{3q+7} = q+3$.

2   Solve for x: $\sqrt{x-4} = \dfrac{x}{4}$

3   Find, to the *nearest tenth*, the positive value of x in
    the equation $\sqrt{x^2+21} = 2x$

4   Solve for x: $x-1 = \sqrt{2x+13}$

5   Solve algebraically: $\sqrt{x+5} + 1 = x$

6   Solve algebraically for x: $\sqrt{3x+1} + 1 = x$

7   Solve algebraically for all values of x:
    $\sqrt{x-5} + x = 7$

8   Solve algebraically for all values of x:
    $\sqrt{x-4} + x = 6$

9   Solve for x: $x + \sqrt{2x-1} = 8$

10 Solve for x: $\sqrt{x^2+7} = x+1$

11 Solve algebraically for x:
    $\sqrt{x^2+x-1} + 11x = 7x+3$

12 Solve the equation $\sqrt{2x-7} + x = 5$ algebraically,
    and justify the solution set.

Module 1 – Polynomial, Rational, and Radical Relationships

Systems in **THREE** variables can have one solution, infinite solutions, or no solution. A solution of such a system is an ordered triple (x, y, z). When you have three variables you are looking for the intersection of planes.

Solve the system of equations.

1.
$$3x - 2y + 4z = 35$$
$$-4x + y - 5z = -36$$
$$5x - 3y + 3z = 31$$

2.
$$2x - y + z = -13$$
$$x + 2y - z = 6$$
$$3x - 2y + 3z = -16$$

3.
$$x - z = 4$$
$$x + y = -2$$
$$2x + y + z = 0$$

4.
$$x - 2y + 3z = 7$$
$$2x + y + z = 4$$
$$-3x + 2y - 2z = -10$$

5.
$$x - 4y + z = 18$$
$$2x + y - 5z = -21$$
$$x + 2y - 2z = -15$$

6.
$$a + b + c = 5$$
$$9a + 3b + c = 25$$
$$4a - 2b + c = 20$$

7.
$$4x - 5y - 6z = 26$$
$$x - 6y + z = 40$$
$$5x - 3y - 7z = 14$$

Solving a Quadratic – Linear System

Solve the systems of equations algebraically. Check your answer with your calculator.

1. $y = x^2$
    $y = 2x$

2. $y = -2x^2 + 7x - 2$
    $y = 3 - 4x$

3. $y = x^2 + 7x + 12$
    $y = 2x + 8$

4. $y = x^2 - x - 20$
    $y = 3x + 12$

Solving a Circular – Linear System

Solve the systems of equations algebraically. Check your answers.

1. $x^2 + y^2 = 100$
     $y - x = 2$

2. $(x - 3)^2 + (y + 2)^2 = 16$
     $2x + 2y = 10$