Name: _____

Quadratic Equations

1) Use the quadratic formula to solve each equation below:

1) $a^2 - 9a + 14 = 0$

2) $r^2 = 3r - 4$

3) $9u^2 - 24u + 16 = 0$

4) $a^2 - 3a = 40$

5) $3t^2 + 9t - 2 = 0$

6) $7a^2 + 6a + 2 = 0$

7) $5w^2 - 2w + 4 = 0$

8) $12a^2 - a - 6 = 0$

9) $2a^2 + 7a = -9 + 3a$

10) $a^2 - \frac{1}{2}a + \frac{1}{16} = 0$

11) $12x^2 + 2x - 4 = 0$

12) $6w^2 - 2w - 1 = 0$

13) $-x^2 - x + 30 = 0$

14) $0.01x^2 + 0.14x + 0.13 = 0$

15) $-0.1x^2 + 1.1x - 2.8 = 0$

16) $\frac{1}{5}x^2 + \frac{1}{5}x - 6 = 0$

17) $x^2 - \frac{1}{2}x - 3 = 0$

18) $-\frac{3}{2}x^2 + \frac{1}{2}x + 1 = 0$

19) $6x^2 + 18x - 24 = 0$

20) $-10x^2 - 34x - 12 = 0$

2) Find the roots of each equation if possible:

1) $(x - 2)^2 + 1 = 2x - 3$

2) $x(2x + 3) = x^2 + 1$

3) $(x + 1)^2 = 2(x - 3)$

4) $x^2 - 2x = (-2)(3 - x)$

5) $(x - 2)(x + 1) = (x - 1)(x + 3)$

6) $(x - 3)(2x + 1) = x(x + 5)$

7) $(2x - 1)(x - 3) = (x + 5)(x - 1)$

3) Suppose 4 and -6 are roots. Find an equation they came from.

4) Find the values of k for each of the following quadratic equations, so that they have two equal roots.

   1) $2x^2 + kx + 3 = 0$

   2) $kx(x - 2) + 6 = 0$

5) Represent the following situations mathematically:

   1) John and Jamal together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 124. We would like to find out how many marbles they had to start with.

   2) A cottage industry produces a certain number of toys in a day. The cost of production of each toy (in rupees) was found to be 55 minus the number of toys produced in a day. On a particular day, the total cost of production was 750 Dhm. We would like to find out the number of toys produced on that day.

   3) The area of a rectangular plot is 528 m^2. The length of the plot (in meters) is one more than twice its breadth. We need to find the length and breadth of the plot.

   4) The product of two consecutive positive integers is 306. We need to find the integers.

   5) Ramadan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. We would like to find Ramadan's present age.

   6) A train travels a distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. We need to find the speed of the train.