Name Key

Quadratic Equations

Date

Solve each equation by factoring.

1) $n^2 - 3n = 0$

$n(n-3)$

$n = 0 \quad n = 3$

2) $p^2 - 2p - 15 = 0$

$(p-5)(p+3)$

$p = 5 \quad p = -3$

3) $2x^2 - 7x - 49 = 0$

$(2x+7)(x-7)$

$x = 7 \quad x = -7/2$

4) $3r^2 + 8r - 3 = 0$

$(3r-1)(r+3)$

$r = \frac{1}{3} \quad r = -3$

Solve each equation by taking square roots.

5) $-n^2 = -12$

$n = \pm 2\sqrt{3}$

6) $x^2 + 4 = 19$

$x^2 = 15$

$x = \pm\sqrt{15}$

Solve each equation by completing the square.

7) $a^2 + 10a + 18 = 9$

$a^2 + 10a + 25 = -9 + 25$

$(a+5)^2 = 16$

$a = -5 \pm 4$

$a = -9 \quad x = -1$

8) $v^2 - 12v - 81 = -9$

$v^2 - 12v + 36 = 72 + 36$

$(v-6)^2 = 108$

$V = 6 \pm \sqrt{108}$

9) $8k^2 + 16k - 26 = -2$

$8k^2 + 16k - 24 = 0$

$8(k^2 + 2k - 3) = 0$

$k^2 + 2k + 1 = 3 + 1$

$\sqrt{(k+1)^2} = \sqrt{4}$

$k + 1 = \pm 2$

$-1 \quad -1$

$k = -1 \pm 2$

$k = -3 \quad k = 1$

10) $3a^2 - 12a + 14 = 5$

$3a^2 - 12a + 9 = 0$

$3(a^2 - 4a + 3) = 0$

$a^2 - 4a + 4 = -3 + 4$

$\sqrt{(a-2)^2} = \sqrt{1}$

$a - 2 = \pm 1$

$+2 \quad +2$

$a = 2 \pm 1$

$a = 3 \quad a = 1$

Solve each equation with the quadratic formula.

11) $x^2 + 8x - 19 = -5$

$a = 1 \quad b = 8 \quad c = -14$

$x = \frac{-8 \pm \sqrt{64 - 4(1)(-14)}}{2}$

$x = \frac{-8 \pm \sqrt{120}}{2}$

$x = \frac{-8}{2} \pm \frac{2\sqrt{30}}{2} = -4 \pm \sqrt{30}$

12) $6x^2 + 4x + 11 = 2$

$a = 6 \quad b = 4 \quad c = 9$

$x = \frac{-4 \pm \sqrt{16 - 4(6)(9)}}{12}$

$x = \frac{-4 \pm \sqrt{-200}}{12}$

$x = \frac{-4}{12} \pm \frac{10i\sqrt{2}}{12} = -\frac{1}{3} \pm \frac{5i\sqrt{2}}{6}$

13) $9v^2 + 6v - 2 = 7$

$a = 9 \quad b = 6 \quad c = -9$

$x = \frac{-6 \pm \sqrt{36 - 4(9)(-9)}}{18}$

$x = \frac{-6 \pm \sqrt{360}}{18}$

$x = \frac{-6}{18} \pm \frac{6\sqrt{10}}{18} = -\frac{1}{3} \pm \frac{\sqrt{10}}{3}$

14) $x^2 + 4x - 16 = -10$

$a = 1 \quad b = 4 \quad c = -6$

$x = \frac{-4 \pm \sqrt{16 - 4(1)(-6)}}{2}$

$x = \frac{-4 \pm \sqrt{40}}{2}$

$x = \frac{-4}{2} \pm \frac{2\sqrt{10}}{2} \quad x = -2 \pm \sqrt{10}$

Solve each equation using the easiest method.

15) $x^2 - 2x - 54 = 9$

$-9 \quad -9$

$x^2 - 2x - 63 = 0$

$(x-9)(x+7) = 0$

$x = 9 \quad x = -7$

16) $7k^2 - 14k - 17 = 4$

$-4 \quad -4$

$7k^2 - 14k - 21 = 0$

$7(k^2 - 2k - 3) = 0$

$7(k-3)(k+1) = 0$

$k = 3 \quad k = -1$