Algebra 2

Name Key

Solving by Factoring

Date _____ Hour ____

Solve each equation by factoring.

1) $(x+3)(6x-1)=0$

$x+3=0$ $\quad 6x-1=0$

$-3\ -3$ $\quad +1\ +1$

$x=-3$ $\quad \frac{6x}{6}=\frac{1}{6}$

$x=\frac{1}{6}$

$x=-3, \frac{1}{6}$

2) $x(x+4)=0$

$x=0$ $\quad x+4=0$

$-4\ -4$

$x=-4$

$x=0,-4$

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

$x(x-3)=0$

$x=0$ $\quad x-3=0$

$+3\ +3$

$x=3$

$x=0,3$

4) $x^2+11x+28=0$

$x^2+7x+4x+28$

$x(x+7)\ 4(x+7)$

$(x+4)(x+7)=0$

$x=-4,-7$

$x+4=0$

$-4\ -4$

$x=-4$

$x+7=0$

$-7\ -7$

$x=-7$

5) $v^2+4v-21=0$

$v^2+7v-3v-21$

$v(v+7)-3(v+7)$

$(v+7)(v-3)=0$

$v=-7,3$

$v+7=0$ $\quad v-3=0$

$-7\ -7$ $\quad +3\ +3$

$v=-7$ $\quad v=3$

6) $r^2+10r+21=0$

$(r+7)(r+3)=0$

$r+7=0$ $\quad r+3=0$

$-7\ -7$ $\quad -3\ -3$

$r=-7$ $\quad r=-3$

$r=-7,-3$

7) $p^2+p-39=3$

$-3\ -3$

$p^2+p-42=0$

$(p+7)(p-6)=0$

$p=-7,6$

$p+7=0$ $\quad p-6=0$

$-7\ -7$ $\quad +6\ +6$

$p=-7$ $\quad p=6$

8) $v^2-23=-7$

$+7\ +7$

$v^2-16=0$

$(v+4)(v-4)=0$

$v=4,-4$

$v+4=0$ $\quad v-4=0$

$-4\ -4$ $\quad +4\ +4$

$v=-4$ $\quad v=4$

9) $x^2=2x$

$-2x\ -2x$

$x^2-2x=0$

$x(x-2)=0$

$x=0,2$

$x=0$ $\quad x-2=0$

$+2\ +2$

$x=2$

10) $k^2=30+k$

$-30\ -k$

$k^2-k-30=0$

$(k-6)(k+5)=0$

$k=6,-5$

$k-6=0$ $\quad k+5=0$

$+6\ +6$ $\quad -5\ -5$

$k=6$ $\quad k=-5$

11) $3m^2 + 14m + 48 = 2m^2$

$-2m^2 \quad -2m^2$

$m^2 + 14m + 48 = 0$

$(m+8)(m+6) = 0$

$m+8=0 \quad m+6=0$

$m = -8, -6$

12) $v^2 + 9v + 12 = -2$

$+2 \quad +2$

$v^2 + 9v + 14 = 0$

$(v+7)(v+2) = 0$

$v = -7, -2$

13) $2r^2 - 9r + 9 = 0$

$2r^2 - 3r - 6r + 9$

$r(2r-3) - 3(2r-3)$

$(2r-3)(r-3) = 0$

$r = \frac{3}{2}, 3$

14) $6p^2 - 23p + 20 = 0$

$6p^2 - 15p - 8p + 20$

$3p(2p-5) - 4(2p-5)$

$(3p-4)(2p-5) = 0$

$p = \frac{4}{3}, \frac{5}{2}$

15) $25x^2 - 5x - 6 = 0$

$25x^2 - 15x + 10x - 6$

$5x(5x-3)\ 2(5x-3)$

$(5x-3)(5x+2) = 0$

$x = \frac{3}{5}, -\frac{2}{5}$

16) $3k^2 - 10k - 25 = 0$

$3k^2 - 15k + 5k - 25$

$3k(k-5)\ 5(k-5)$

$(3k+5)(k-5) = 0$

$k = -\frac{5}{3}, 5$

17) $3x^2 + x + 4 = 4$

$-4 \quad -4$

$3x^2 + x = 0$

$x(3x+1) = 0$

$x = 0, -\frac{1}{3}$

18) $4n^2 + 11n + 1 = -5$

$+5 \quad +5$

$4n^2 + 11n + 6 = 0$

$4n^2 + 8n + 3n + 6$

$4n(n+2)\ 3(n+2)$

$(4n+3)(n+2) = 0$

$n = -\frac{3}{4}, -2$

19) $5r^2 - 10 = 23r$

$-23r \quad -23r$

$5r^2 - 23r - 10 = 0$

$5r^2 - 25r + 2r - 10$

$5r(r-5)\ 2(r-5)$

$(5r+2)(r-5) = 0$

$r = -\frac{2}{5}, 5$

20) $5x^2 + 5 = 26x$

$-26x \quad -26x$

$5x^2 - 26x + 5 = 0$

$5x^2 - 25x - 1x + 5$

$5x(x-5) - 1(x-5)$

$(5x-1)(x-5) = 0$

$x = \frac{1}{5}, 5$

21) $3x^2 - 4 = -4x$

$+4x \quad +4x$

$3x^2 + 4x - 4 = 0$

$3x^2 + 6x - 2x - 4$

$3x(x+2) - 2(x+2)$

$(3x-2)(x+2) = 0$

$x = \frac{2}{3}, -2$

22) $10x^2 - 3x - 1 = -2x + 2$

$+2x \quad -2 \quad +2x \quad -2$

$10x^2 - x - 3 = 0$

$10x^2 - 6x + 5x - 3$

$2x(5x-3)\ 1(5x-3)$

$(5x-3)(2x+1) = 0$

$x = \frac{3}{5}, -\frac{1}{2}$

23) $\sqrt{108} = 6\sqrt{3}$ 24) $\sqrt{98} = 7\sqrt{2}$ 25) $\sqrt{80} = 4\sqrt{5}$ 26) $\sqrt{392} = 14\sqrt{2}$