 Name_____

Multi-Step Equations

Date_____ Period____

Solve each equation.

1) $6a + 5a = -11$

2) $-6n - 2n = 16$

3) $4x + 6 + 3 = 17$

4) $0 = -5n - 2n$

5) $6r - 1 + 6r = 11$

6) $r + 11 + 8r = 29$

7) $-10 = -14v + 14v$

8) $-10p + 9p = 12$

9) $42 = 8m + 13m$

10) $a - 2 + 3 = -2$

11) $18 = 3(3x - 6)$

12) $30 = -5(6n + 6)$

13) $37 = -3 + 5(x + 6)$

14) $-13 = 5(1 + 4m) - 2m$

15) $4(-x + 4) = 12$

16) $-2 = -(n - 8)$

17) $-6(1 - 5v) = 54$

18) $8 = 8v - 4(v + 8)$

19) $10(1 + 3b) = -20$

20) $-5n - 8(1 + 7n) = -8$

21) $8(4k - 4) = -5k - 32$

22) $-8(-8x - 6) = -6x - 22$

23) $8(1 + 5x) + 5 = 13 + 5x$

24) $-11 - 5a = 6(5a + 4)$

25) $-5(4x-2)=-2(3+6x)$

26) $5(2x+6)=-4(-5-2x)+3x$

Kuta Software - Infinite Pre-Algebra

Name_____

Multi-Step Equations

Date_____ Period____

Solve each equation.

1) $6a + 5a = -11$

{−1}

2) $-6n - 2n = 16$

{−2}

3) $4x + 6 + 3 = 17$

{2}

4) $0 = -5n - 2n$

{0}

5) $6r - 1 + 6r = 11$

{1}

6) $r + 11 + 8r = 29$

{2}

7) $-10 = -14v + 14v$

No solution.

8) $-10p + 9p = 12$

{−12}

9) $42 = 8m + 13m$

{2}

10) $a - 2 + 3 = -2$

{−3}

11) $18 = 3(3x - 6)$

{4}

12) $30 = -5(6n + 6)$

{−2}

13) $37 = -3 + 5(x + 6)$

{2}

14) $-13 = 5(1 + 4m) - 2m$

{–1}

15) $4(-x + 4) = 12$

{1}

16) $-2 = -(n - 8)$

{10}

17) $-6(1 - 5v) = 54$

{2}

18) $8 = 8v - 4(v + 8)$

{10}

19) $10(1 + 3b) = -20$

{–1}

20) $-5n - 8(1 + 7n) = -8$

{0}

21) $8(4k - 4) = -5k - 32$

{0}

22) $-8(-8x - 6) = -6x - 22$

{–1}

23) $8(1 + 5x) + 5 = 13 + 5x$

{0}

24) $-11 - 5a = 6(5a + 4)$

{–1}

25) $-5(4x - 2) = -2(3 + 6x)$

{2}

26) $5(2x + 6) = -4(-5 - 2x) + 3x$

{10}

1. Add or subtract the following polynomials and simplify.

   (a) $(5x+2)+(3x+6)$

   (b) $(9x-8)-(2x+1)$

   (c) $(-7x^2+x+2)-(9x^2+6)$

   (d) $(2x+1)+(6x+1)$

   (e) $(6y+4)+(2y+12)$

   (f) $(z-16)+7(3z+6)-(2z+1)$

   (g) $(6z^2+2)+z(2z+4)-2(2z+6)$

   (h) $(7x^3+3x^2-2)+x^2(3x+6)$

   (i) $x(x^2+2)-2x^2(3x+6)$

   (j) $(-12x^4+18x^2)+3x^2(4x^2-6)$

2. Multiply and simplify the following expressions.

   (a) $(x+4)(x^2-2x+5)$

   (b) $(2x^3-8)(4x^2+x)$

   (c) $(\sqrt{x}+2)(\sqrt{x}+6)$

   (d) $(\sqrt{x}+1)(\sqrt{x}-1)$

   (e) $\sqrt{x}(x+\sqrt{x})$

   (f) $z^{1/4}(z^{1/2}+z^{3/4})$

   (g) $((6z^2+2)+z^2)((6z^2+2)-z^2)$

   (h) $(\sqrt{x^2-3}+3)(\sqrt{x^2-3}-3)$

   (i) $(x^{1/2}+y^2)(x^{1/2}-y^2)$

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

   (k) $(5x-\sqrt{3})(5x+\sqrt{3})$

   (l) $(2x^2-y^2)(2x^2+y^2)$

3. Expand the following.

   (a) $(2b+1)^2$

   (b) $(3+x)^4$

   (c) $(1-3m)^3$

   (d) $(y+2)^3$

   (e) $(y-4)^4$

   (f) $(4y-1)^3$

   (g) $(2x-3)^3$

   (h) $(x-2)^5$

   (i) $(2x+1)^4$

4. Divide.

(a) $(12x^3 - 11x^2 + 9x + 18) \div (4x + 3)$

(b) $(2x^4 - x^3 - 7x^2 - 3x + 10) \div (x - 2)$

(c) $(5x^3 - x^2 + 6) \div (x + 1)$

(d) $(x^4 + 4x^3 + x - 10) \div (x^2 + 3x - 5)$

(e) $(6x^3 - 8x + 5) \div (2x - 4)$

(f) $(x^3 - 4x^2 + 2x - 5) \div (x - 2)$

(g) $(2x^3 + 4x^2 - 5) \div (x + 3)$

(h) $(2x^3 - 4x + 7x^2 + 7) \div (x^2 + 2x - 1)$

(i) $(4x^3 - 2x^2 - 3) \div (2x^2 - 1)$

(j) $(3x^3 + 4x + 11) \div (x^2 - 3x + 2)$

5. Divide the following polynomials.

(a) $(4b^3 - 16b^2 - 2) \div (b - 4)$

(b) $(a^3 + 12a^2 + 34a - 19) \div (a + 6)$

(c) $(7k^3 - 42k^2 - 9) \div (k - 6)$

(d) $(p^3 - 36p - 10) \div (p - 6)$

(e) $(5p^3 - 32p^2 + 44p - 45) \div (p - 5)$

(f) $\dfrac{x^3 + 9x^2 + 17x - 12}{x + 4}$

Answers

1. (a) $8x + 8$ (b) $7x - 9$ (c) $-16x^2 + x - 8$ (d) $8x + 2$
   (e) $8y + 16$ (f) $20z + 25$ (g) $8z^2 - 10$ (h) $10x^3 + 9x^2 - 2$
   (i) $-5x^3 - 12x^2 + 2x$ (j) 0

2. (a) $x^3 + 2x^2 - 3x + 20$ (b) $8x^5 + 2x^4 - 32x^2 - 8x$ (c) $x + 8\sqrt{x} + 12$
   (d) $x - 1$ (e) $x^{3/2} + x$ (f) $z^{3/4} + z$
   (g) $35z^4 + 24z^2 + 4$ (h) $x^2 - 12$ (i) $x - y^4$
   (j) $4x^2 - 9$ (k) $25x^2 - 3$ (l) $4x^4 - y^4$

3. (a) $4b^2 + 4b + 1$ (b) $81 + 108x + 54x^2 + 12x^3 + x^4$
   (c) $1 - 9m + 27m^2 - 27m^3$ (d) $y^3 + 6y^2 + 12y + 8$
   (e) $y^4 - 16y^3 + 96y^2 - 256y + 256$ (f) $64y^3 - 48y^2 + 12y - 1$
   (g) $8x^3 - 36x^2 + 54x - 27$ (h) $x^5 - 10x^4 + 40x^3 - 80x^2 + 80x - 32$
   (i) $16x^4 + 32x^3 + 24x^2 + 8x + 1$

4. (a) $3x^2 - 5x + 6$ (b) $2x^3 + 3x^2 - x - 5$ (c) $5x^2 - 6x + 6$
   (d) $x^2 + x + 2$ (e) $3x^2 + 6x + 8 + \dfrac{37}{2(x-2)}$ (f) $x^2 - 2x - 2 - \dfrac{9}{x-2}$
   (g) $2x^2 - 2x + 6 - \dfrac{23}{x+3}$ (h) $2x + 3 - \dfrac{2(4x-5)}{x^2+2x-1}$ (i) $2x - 1 + \dfrac{2(x-2)}{2x^2-1}$
   (j) $3x + 9 + \dfrac{25x-7}{x^2-3x+2}$

5. (a) $4b^2 - \dfrac{2}{b-4}$ (b) $a^2 + 6a - 2 - \dfrac{7}{a+6}$ (c) $7k^2 - \dfrac{9}{k-6}$
   (d) $p^2 + 6p - \dfrac{10}{p-6}$ (e) $5p^2 - 7p + 9$ (f) $x^2 + 5x - 3$

 Name_____

Factoring Trinomials (a = 1)

Date_____ Period____

Factor each completely.

1) $b^2 + 8b + 7$

2) $n^2 - 11n + 10$

3) $m^2 + m - 90$

4) $n^2 + 4n - 12$

5) $n^2 - 10n + 9$

6) $b^2 + 16b + 64$

7) $m^2 + 2m - 24$

8) $x^2 - 4x + 24$

9) $k^2 - 13k + 40$

10) $a^2 + 11a + 18$

11) $n^2 - n - 56$

12) $n^2 - 5n + 6$

13) $b^2 - 6b + 8$

14) $n^2 + 6n + 8$

15) $2n^2 + 6n - 108$

16) $5n^2 + 10n + 20$

17) $2k^2 + 22k + 60$

18) $a^2 - a - 90$

19) $p^2 + 11p + 10$

20) $5v^2 - 30v + 40$

21) $2p^2 + 2p - 4$

22) $4v^2 - 4v - 8$

23) $x^2 - 15x + 50$

24) $v^2 - 7v + 10$

25) $p^2 + 3p - 18$

26) $6v^2 + 66v + 60$

Name_____

Factoring Trinomials (a = 1)

Date_____ Period____

Factor each completely.

1) $b^2 + 8b + 7$

$(b + 7)(b + 1)$

2) $n^2 - 11n + 10$

$(n - 10)(n - 1)$

3) $m^2 + m - 90$

$(m - 9)(m + 10)$

4) $n^2 + 4n - 12$

$(n - 2)(n + 6)$

5) $n^2 - 10n + 9$

$(n - 1)(n - 9)$

6) $b^2 + 16b + 64$

$(b + 8)^2$

7) $m^2 + 2m - 24$

$(m + 6)(m - 4)$

8) $x^2 - 4x + 24$

Not factorable

9) $k^2 - 13k + 40$

$(k - 5)(k - 8)$

10) $a^2 + 11a + 18$

$(a + 2)(a + 9)$

11) $n^2 - n - 56$

$(n + 7)(n - 8)$

12) $n^2 - 5n + 6$

$(n - 2)(n - 3)$

13) $b^2 - 6b + 8$

$(b - 4)(b - 2)$

14) $n^2 + 6n + 8$

$(n + 2)(n + 4)$

15) $2n^2 + 6n - 108$

$2(n + 9)(n - 6)$

16) $5n^2 + 10n + 20$

$5(n^2 + 2n + 4)$

17) $2k^2 + 22k + 60$

$2(k + 5)(k + 6)$

18) $a^2 - a - 90$

$(a - 10)(a + 9)$

19) $p^2 + 11p + 10$

$(p + 10)(p + 1)$

20) $5v^2 - 30v + 40$

$5(v - 2)(v - 4)$

21) $2p^2 + 2p - 4$

$2(p - 1)(p + 2)$

22) $4v^2 - 4v - 8$

$4(v + 1)(v - 2)$

23) $x^2 - 15x + 50$

$(x - 10)(x - 5)$

24) $v^2 - 7v + 10$

$(v - 5)(v - 2)$

25) $p^2 + 3p - 18$

$(p - 3)(p + 6)$

26) $6v^2 + 66v + 60$

$6(v + 10)(v + 1)$

 Name_____

Solving Quadratic Equations by Factoring

Date_____ Period____

Solve each equation by factoring.

1) $(k+1)(k-5)=0$

2) $(a+1)(a+2)=0$

3) $(4k+5)(k+1)=0$

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

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

6) $n^2+7n+15=5$

7) $n^2-10n+22=-2$

8) $n^2+3n-12=6$

9) $6n^2-18n-18=6$

10) $7r^2-14r=-7$

11) $n^2 + 8n = -15$

12) $5r^2 - 44r + 120 = -30 + 11r$

13) $-4k^2 - 8k - 3 = -3 - 5k^2$

14) $b^2 + 5b - 35 = 3b$

15) $3r^2 - 16r - 7 = 5$

16) $6b^2 - 13b + 3 = -3$

17) $7k^2 - 6k + 3 = 3$

18) $35k^2 - 22k + 7 = 4$

19) $7x^2 + 2x = 0$

20) $10b^2 = 27b - 18$

21) $8x^2 + 21 = -59x$

22) $15a^2 - 3a = 3 - 7a$

 Name_____

Solving Quadratic Equations by Factoring

Date_____ Period____

Solve each equation by factoring.

1) $(k+1)(k-5)=0$

$\{-1, 5\}$

2) $(a+1)(a+2)=0$

$\{-1, -2\}$

3) $(4k+5)(k+1)=0$

$\left\{-\frac{5}{4}, -1\right\}$

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

$\left\{-\frac{3}{2}, -\frac{3}{4}\right\}$

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

$\{3, 8\}$

6) $n^2+7n+15=5$

$\{-5, -2\}$

7) $n^2-10n+22=-2$

$\{6, 4\}$

8) $n^2+3n-12=6$

$\{3, -6\}$

9) $6n^2-18n-18=6$

$\{4, -1\}$

10) $7r^2-14r=-7$

$\{1\}$

11) $n^2 + 8n = -15$

$\{-5, -3\}$

12) $5r^2 - 44r + 120 = -30 + 11r$

$\{6, 5\}$

13) $-4k^2 - 8k - 3 = -3 - 5k^2$

$\{8, 0\}$

14) $b^2 + 5b - 35 = 3b$

$\{-7, 5\}$

15) $3r^2 - 16r - 7 = 5$

$\left\{-\frac{2}{3}, 6\right\}$

16) $6b^2 - 13b + 3 = -3$

$\left\{\frac{2}{3}, \frac{3}{2}\right\}$

17) $7k^2 - 6k + 3 = 3$

$\left\{\frac{6}{7}, 0\right\}$

18) $35k^2 - 22k + 7 = 4$

$\left\{\frac{1}{5}, \frac{3}{7}\right\}$

19) $7x^2 + 2x = 0$

$\left\{-\frac{2}{7}, 0\right\}$

20) $10b^2 = 27b - 18$

$\left\{\frac{6}{5}, \frac{3}{2}\right\}$

21) $8x^2 + 21 = -59x$

$\left\{-\frac{3}{8}, -7\right\}$

22) $15a^2 - 3a = 3 - 7a$ $\left\{\frac{1}{3}, -\frac{3}{5}\right\}$

 Name_____

Using the Quadratic Formula

Date_____ Period____

Solve each equation with the quadratic formula.

1) $m^2 - 5m - 14 = 0$

2) $b^2 - 4b + 4 = 0$

3) $2m^2 + 2m - 12 = 0$

4) $2x^2 - 3x - 5 = 0$

5) $x^2 + 4x + 3 = 0$

6) $2x^2 + 3x - 20 = 0$

7) $4b^2 + 8b + 7 = 4$

8) $2m^2 - 7m - 13 = -10$

9) $2x^2 - 3x - 15 = 5$

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

11) $2k^2 + 9k = -7$

12) $5r^2 = 80$

13) $2x^2 - 36 = x$

14) $5x^2 + 9x = -4$

15) $k^2 - 31 - 2k = -6 - 3k^2 - 2k$

16) $9n^2 = 4 + 7n$

17) $8n^2 + 4n - 16 = -n^2$

18) $8n^2 + 7n - 15 = -7$

 Name_____

Using the Quadratic Formula

Date_____ Period____

Solve each equation with the quadratic formula.

1) $m^2 - 5m - 14 = 0$

$\{7, -2\}$

2) $b^2 - 4b + 4 = 0$

$\{2\}$

3) $2m^2 + 2m - 12 = 0$

$\{2, -3\}$

4) $2x^2 - 3x - 5 = 0$

$\left\{\frac{5}{2}, -1\right\}$

5) $x^2 + 4x + 3 = 0$

$\{-1, -3\}$

6) $2x^2 + 3x - 20 = 0$

$\left\{\frac{5}{2}, -4\right\}$

7) $4b^2 + 8b + 7 = 4$

$\left\{-\frac{1}{2}, -\frac{3}{2}\right\}$

8) $2m^2 - 7m - 13 = -10$

$\left\{\frac{7 + \sqrt{73}}{4}, \frac{7 - \sqrt{73}}{4}\right\}$

9) $2x^2 - 3x - 15 = 5$

$\left\{4, -\frac{5}{2}\right\}$

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

$\{1, -3\}$

11) $2k^2 + 9k = -7$

$\left\{-1, -\frac{7}{2}\right\}$

12) $5r^2 = 80$

$\{4, -4\}$

13) $2x^2 - 36 = x$

$\left\{\frac{9}{2}, -4\right\}$

14) $5x^2 + 9x = -4$

$\left\{-\frac{4}{5}, -1\right\}$

15) $k^2 - 31 - 2k = -6 - 3k^2 - 2k$

$\left\{\frac{5}{2}, -\frac{5}{2}\right\}$

16) $9n^2 = 4 + 7n$

$\left\{\frac{7 + \sqrt{193}}{18}, \frac{7 - \sqrt{193}}{18}\right\}$

17) $8n^2 + 4n - 16 = -n^2$

$\left\{\frac{-2 + 2\sqrt{37}}{9}, \frac{-2 - 2\sqrt{37}}{9}\right\}$

18) $8n^2 + 7n - 15 = -7$

$\left\{\frac{-7 + \sqrt{305}}{16}, \frac{-7 - \sqrt{305}}{16}\right\}$