NOTES SECTION 2.1: THE DISTRIBUTIVE PROPERTY

Combine Like Terms

1. $x^2 + x^2$

2. $(2x^2 - 4x + 6) + (x^2 + 5x - 3)$

3. $(2x^2 - 4x + 6) - (x^2 + 5x - 3)$

Multiplying Using the Distributive Property

4. $a(b + c)$

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

Factoring Using the Distributive Property

6. $x^2 - 5x$

7. $9x^3 + 36x^2$

8. $28x^4y^3 + 35xy^3 - 14x^2y^2$

Multiplying Binomials

9. $(x + 3)(x + 1)$

10. $(x + 2)^2$

11. $(x - 6)(x + 6)$

Solve:

12. $x(x + 1) = 0$

13. $x^2 + 5x = 0$

HOMEWORK SECTION 2.1 THE DISTRIBUTIVE PROPERTY

Simplify:

1. $4(x+5)$
2. $b(b^2-7)$
3. $(2n)+(n^2-8n+3)$
4. $(2n)(n^2-8n+3)$
5. $(2n)-(n^2-8n+3)$
6. $(2k+5)(7k)$
7. $(x+3)(x+8)$
8. $(2a-7)(a+4)$

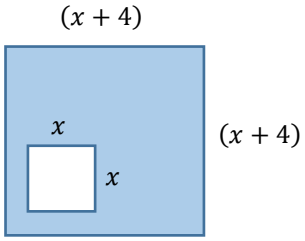
Factor:

9. $15\mathrm{k}+27$
10. $-18q^3-6q^2$
11. $108s^3t^2-60s^5t$
12. $24ab^3c-60ac^4$
13. $20m^2n^4+80m^3n^3-35m^2n^2$
14. $120b^4-64b^2+72b$
15. $z(6x^4+27x^3+18x^2)$
16. $(x-3)(x+2)-(x+2)^2$
17. $(x-8)(x-5)+(x^2-3)(x-8)$

Solve:

18. $x(x+3)=0$
19. $x^2-4x=0$
20. $8d^3+28d^2=0$

21. Write a simplified expression that represents the shaded area.



22. The area of a rectangular paper is given by the binomial $25x^2 - 50x$.
What are <u>two linear expressions</u> that can represent possible dimensions of the paper?

NOTES SECTION 2.2 FACTORING BY GROUPING

Factor:	Check:
1. $2m^3 + 8m^2 + 9m + 36$	
2. $6x^3 + 9x^2 + 2x + 3$	
3. $64d^3 - 40d^2 - 24d + 15$	
4. $3x^6 + 5x^4 - 3x^2 - 5$	

5. Solve the equation: $2x^2 + 3x = 7x$

HOMEWORK SECTION 2.2: GROUPING

Simplify:

1. $2x(3x-4)-(8x-1)$

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

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

4. $(b^2-3b+2)(2b^2+b-4)$

Factor:	Check:
5. $2m^3+8m^2+9m+36$	
6. $10s^3+25s^2+8s+20$	
7. $6x^3+9x^2+2x+3$	
8. $8w^3+12w^2+10w+15$	
9. $64d^3-40d^2-24d+15$	
10. $24c^3-84c^2+10c-35$	

Solve:

11. $5y^2 = 35y$

12. $6a = 15a^2$

13. $2c = 12c^2 - 8c$

14. A poster in the shape of a rectangle has an area of $x^3 - 2x^2 + x - 2$. What are <u>two expressions</u> that can represent possible dimensions of the poster?

15. You are painting a rectangular wall with length $(2x - 1)$ ft and width $(3x + 1)$ ft. There is a rectangular door that measures $(x + 1)$ ft by 2x ft that will not be painted. Write a simplified expression that represents the area of the wall that will be painted.

16. Factor $4w^2(w + 1) - (w + 1)^2$

NOTES & HOMEWORK SECTION 2.3: TRINOMIALS

Simplify:

1. $(2q + 5)(4q - 9)$

2. $(8u - 7) - (u - 6)$

3. $(d + 4)(d + 4)$

4. $(5r - 2) + (5r - 2)$

5. $(3k - 8)^2$

Factor:

Factor:	Check:
6. $3d^2 + 20d + 12$	Not required to check this one.
7. $5z^2 - 17z + 14$	Not required to check this one.
8. $3p^2 - 7p - 40$	Not required to check this one.
9. $16r^2 - 72r + 81$	Not required to check this one.
10. $4x^2 - 36x + 81$	Not required to check this one.

11. $p^2 + 9p - 36$	
12. $x^2 + 5xy - 14y^2$	
13. $g^2 - 13gh + 42h^2$	
14. $y^4 + 9y^2 + 20$	
15. $r^6 - 4r^3 - 32$	

Solve:

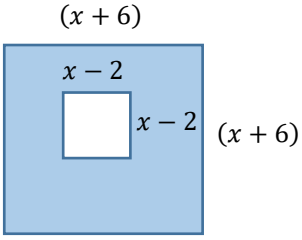
16. $b^2 - 5b + 6 = 0$

17. $c^2 + c = 30$

18. $2x^2 - x - 15 = 0$

19. The area of a rectangular painting is given by the trinomial $z^2 - 6z - 16$.
What are <u>two linear expressions</u> that can represent possible dimensions of the painting?

20. Write a simplified expression that represents the shaded area.



NOTES SECTION 2.4 SPECIAL CASES

Factoring the Difference of Two Squares

1. $x^2 - y^2$ 2. $x^2 - 1$ 3. $x^2 - 49$

4. $49x^2 - 1$ 5. $49x^2 - 25y^2$

Sum of Two Cubes

6. $a^3 + b^3$ 7. $a^3 + 8$

Difference of Two Cubes

8. $a^3 - 1$ 9. $a^3 - b^3$ 10. $343x^3 - 64$

HOMEWORK SECTION 2.4: SPECIAL CASES

Simplify:

1. $(2p^2 + 4p - 3)(5p^2 - p + 7)$

2. $(2v^3 + 4) + (v^2 + 7v)$

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

4. $(x - 2)^3$

Factor:	Check:
5. $x^2 - 4$	
6. $a^3 + 8$	
7. $x^3 - y^3$	
8. $k^3 + 1$	
9. $36p^2 - q^2$	

10. $64 + m^3$	
11. $a^3b^3 - c^3$	Not required to check this one.
12. $27n^3 - 1$	Not required to check this one.
13. $144j^4 - 25$	Not required to check this one.
14. $343b^3 + 64$	Not required to check this one.
15. $9z^2 - 1$	Not required to check this one.
16. $27j^3 - 125k^3$	Not required to check this one.
17. $a^6 - 8$	Not required to check this one.

Solve:

18. $z^2 - 16 = 0$

19. $9a^2 - 16 = 0$

20. $4 = 16x^2$

21. The volume of a rectangular prism is $[x^3(x + 2) + 27(x + 2)]$ cubic inches. What are three linear expressions that can represent possible dimensions of the shipping box?

22. A medical center's rectangular parking lot currently has a length of 30 meters and a width of 20 meters. The center plans to expand both the length and the width of the parking lot by 2x meters. Write a polynomial in standard form that represents the area of the expanded parking lot.

23. Factor: $x^2(x^2 - 4) - (x^2 - 4)$

SECTION 2.5: MULTI-STEP PROBLEMS

Simplify:

1. $(2z-5)+(2z^2+7z-1)$

2. $(x^2+2x+1)(x^2+7x-4)$

3. $(x-4)^3$

4. $(x+2)(2x+1)(x-5)$

5. $(6g-1)-(g^2+2)$

Factor:

6. $5c^2-125$

7. $2x^2+10x+8$

8. $32x^3+8x^2+48x+12$

9. $24a^2-54b^2$

10. $3w^2-24w-27$

11. $15c^3+15$

12. $2x^3+5x^2-8x-20$

13. $36x^3y-64xy^3$

14. $4n^2+62n-32$

15. $12z^3+48z^2-27z-108$

16. $2w^3+128$

17. m^4-n^4

18. $6m^2 + 21m + 15$

19. $63k^3 - 27k^2 - 7k + 3$

20. $2k^4 - 32$

21. $24t^2 + 96t + 90$

22. $3x^6 + 5x^4 - 3x^2 - 5$

23. $2k^4 - 16k$

24. $5w^8 - 5$

25. $6a^6 + 21a^3b^2 - 12b^4$

26. $60a^5 - 72a^4 - 210a^3 + 252a^2$

27. $3r^6 - 27y^4$

28. $(x^2 - 10)(x + 2) - (x + 2)^2$

29. $(x - 8)^2 + (x^2 + 2)(x - 8)$

Solve

30. $9x^2 = 66x - 21$

31. $4z^2 + 62z = 32$

32. $2x^3 + 3x^2 = 2x + 3$

33. $18a^3 = 32a$

34. The volume of a rectangular prism is $(128x^3 - 50x)$ cubic inches. What are <u>three linear expressions</u> that can represent possible dimensions of the rectangular prism?

35. A rectangular poster has dimensions $(2x - 1)$ by $(3x + 2)$. Two congruent squares are cut out of the poster both with side length of $x + 1$. Write a simplified expression that represents the area of the poster that will remains after cutting out the two squares

Unit 1 Review A

Simplify.

1. $(5a^4 - 2a^3 + 4a^2 + 5a) + (5a^3 - 5a^2 + 2)$

2. $(4m^4 - 3m^3 + 6m^2 + 5m - 4) - (6m^3 - 8m^2 - 3m + 1)$

Simplify the expression.

4. $(2x + 1)(x + 4)$

5. $(2x^2 - 3)(x - 2)$

6. $(6x^2 + 5)(2x^3 + 1)$

7. $(1 - 2x)(1 + 2x)$

8. $(2x + 5y)^2$

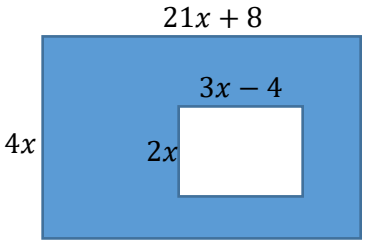
9. $(2x^2 + 3)(2x^2 - 3)$

10. $(x - 2)^3$

11. $(x + 7)(x + 4)(x - 7)$

12. $(4x^2 - 2x - 1)(3x - 1)$

13. Write an expression for the area of the shaded region.



Factor completely

14. $y^2 + 8y$

15. $5m^5n + 10m^3$

16. $4a^4b^4 - 2a^3b^2 + 6a^2$

17. $9a^2 - 16$

18. $100y^6 - 49y^4$

19. $27x^2 - 48y^2$

20. $x^2 - 16x + 64$

21. $4x^2 + 40x + 100$

22. $x^2 + 6xy - 72y^2$

23. $12x^2 + 31x + 20$

24. $6x^2 + 13xy + 6y^2$

25. $12x^4 + 28x^2y^2 - 24y$

26. $12x^2 + 40x + 25$

27. $14x^2 + 35x + 14$

28. $3x^2 - 4x + 1$

29. $x^3 + 3x^2 + 2x + 6$

30. $8a^3 - 12a^2 + 6a - 931.$

$2x^2 - 4x + xz - 2z$

32. $4x^5 + 6x^4 + 6x^3 + 9x^2$

33. Factor out the GCF without simplifying: $(y - 6)^2 + (x - 1)(y - 6)$

Solve for the value of the variable.

34. $2x^2 + 6x = 0$ 35. $4x^2 = 25$ 36. $7x^2 + 15x + 2 = 0$

37. $20x^3 - 4x^2 - 72x = 0$

Factor Completely

38. $x^3 + 125$ 39. $216x^3 - y^3$ 40. $3x^3 + 81$ 41. $x^6 + 8$

42. A rectangular prism has a volume of $6x^3 - 28x^2 - 48x$ cubic centimeters. Give 3 variable expressions that could represent the dimensions of the box.

43. A rectangular prism has a volume of $x^3 + 3x^2 - x - 3$ cubic inches . Give 3 variable expressions that could represent the dimensions of the box.

44. The volume of a rectangular prism is $3x^4 + 192x$ cubic inches. If the height of the prism is $3x$ inches, find the possible lengths and widths of the solid.

Honors Math 2

Unit 1 Review B

Adding & Subtracting Polynomials

1. $(3y + 4y^3 - 17y^2) + (20y^2 + 16 - 3y)$

2. $(5a^4 - 2a^3 + 4a^2 + 5a) + (5a^3 - 5a^2 + 2)$

3. $(3x^3 + 12x - 15) - (6x^3 - 5x + 12)$

4. $(4m^4 - 3m^3 + 6m^2 + 5m - 4) - (6m^3 - 8m^2 - 3m + 1)$

Multiplication

5. $(4x^2 + 3)(2x - 5)$

6. $(2x^2 - 3)(x - 2)$

7. $(x + 2)(3x - 4)(2x + 1)$

8. $(x+7)(x+4)(x-7)$

9. $(3x^2-2x+4)(x^2+5x-2)$

Factor

10. $35x^7-56x^3$

11. $5m^5n+10m^3$

12. $3y^2+24xy+45x^2$

13. $6x^2+13xy+6y^2$

14. $75x^4-12x^2$

15. $27x^2-48y^2$

16. $6x^2-5x-6$

17. $3x^3 - 5x^2 - 27x + 45$

18. $8a^3 - 12a^2 + 6a - 9$

19. $x^4 + 3x^2 - 4$

20. $27x^3 - 1$

21. $x^6 + 8$

22. $32x^2 + 112xy + 98y^2$

23. $(x-3)^2 - (x-3)(x+5)$

24. $(y-6)^2 + (x-1)(y-6)$

Solve

25. $2x^4 + 250x = 0$

26. $4x^2 = 25$

27. $-3x = 4x^2$

28. $18x^3 = -27x^2 + 8x - 12$

29. $4x^2 = 36$

30. A rectangular paper has dimensions $(2x + 3)$ and $(x - 4)$. A square hole with side length (x+1) is cut out of the paper. What is the remaining area of the paper.

31. A rectangular prism has volume of $6x^3 - 28x^2 - 48x$ cubic centimeters. Give 3 variables expressions that could represent the dimensions of the box.

These homework answers are in a random order. After you finish a problem, check to make sure your answer is on this list.

Homework 2.1

a. $0,\ 4$
b. $0,\ -3$
c. $n^2 - 6n + 3$
d. $x - 2$ and $25x$
e. $14k^2 + 35k$
f. $(x - 8)(x^2 + x - 8)$
g. $-5(x + 2)$
h. $5m^2n^2(4n^2 + 16mn - 7)$
i. $b^3 - 7b$
j. $2n^3 - 16n^2 + 6n$
k. $12s^3t(9t - 5s^2)$
l. $3(5k + 9)$
m. $-n^2 + 10n - 3$
n. $2a^2 + a - 28$
o. $3x^2z(2x^2 + 9x + 6)$
p. $0, -\frac{7}{2}$
q. $8b(15b^3 - 8b + 9)$
r. $4x + 20$
s. $8x + 16$
t. $-6q^2(3q + 1)$
u. $x^2 + 11x + 24$
v. $12ac(2b^3 - 5c^3)$

Homework 2.2

a. $0,\ 7$
b. $x - 2,\ x^2 + 1$
c. $(2x + 3)(3x^2 + 1)$
d. $0,\ \frac{2}{5}$
e. $(2s + 5)(5s^2 + 4)$
f. $(8d - 5)(8d^2 - 3)$
g. $4x^2 - 3x - 1$
h. $(w + 1)(4w^2 - w - 1)$
i. $6x^2 - 16x + 1$
j. $(2x + 3)(3x^2 + 1)$
k. $(m + 4)(2m^2 + 9)$
l. $(2c - 7)(12c^2 + 5)$
m. $2b^4 - 5b^3 - 3b^2 + 14b - 8$
n. $0,\ \frac{5}{6}$
o. $3^3 + 5x^2 + x + 6$
p. $3x^2 + 5$

Homework 2.3

a. $3,\ -\frac{5}{2}$
b. $(x + 7y)(x - 2y)$
c. $10r - 4$
d. $(g - 6\text{h})(g - 7\text{h})$
e. $(5z - 7)(z - 2)$
f. $9k^2 - 48k + 64$
g. $(p + 12)(p - 3)$
h. $(3p + 8)(p - 5)$
i. $7u - 1$
j. $(d + 6)(3d + 2)$
k. $(2x - 9)^2$
l. $(y^2 + 4)(y^2 + 5)$
m. $z - 8,\ z + 2$
n. $(4r - 9)^2$
o. $d^2 + 8d + 16$
p. -6, 5
q. $(r^3 - 8)(r^3 + 4)$
r. $2,\ 3$
s. $16x + 32$
t. $8q^2 + 2q - 45$

Homework 2.4

a. $x^3 - 6x^2 + 12x - 8$
b. $(k + 1)(k^2 - k + 1)$
c. $(6p - q)(6p + q)$
d. $(3j - 5k)(9j^2 + 15jk + 25k^2)$
e. $(ab - c)(a^2b^2 + abc + c^2)$
f. $2v^3 + v^2 + 7v + 4$
g. $(3n - 1)(9n^2 + 3n + 1)$
h. $-x^2 - x + 2$
i. $-\frac{4}{3},\ \frac{4}{3}$
j. $(12j^2 - 5)(12j^2 + 5)$
k. $4x^2 + 100x + 600$
l. $(x + 2)(x - 2)$
m. $-\frac{1}{2},\ \frac{1}{2}$
n. $(x - y)(x^2 + xy + y^2)$
o. $(3z + 1)(3z - 1)$
p. $10p^4 + 18p^3 - 5p^2 + 31p - 21$
q. -4, 4
r. $(a + 2)(a^2 - 2a + 4)$
s. $(x + 2)(x - 2)(x + 1)(x - 1)$
t. $(a^2 - 2)(a^4 + 2a^2 + 4)$
u. $(7b + 4)(49b^2 - 28b + 16)$
v. $x + 2,\ x + 3,\ x^2 - 3x + 9$
w. $(4 + m)(16 - 4m + m^2)$

Homework 2.5

1. $2z^2 + 9z - 6$
2. $x^4 + 9x^3 + 11x^2 - x - 4$
3. $x^3 - 12x^2 + 48x - 64$
4. $2x^3 - 5x^2 - 23x - 10$
5. $-g^2 + 6g - 3$
6. $5(c + 5)(c - 5)$
7. $2(x + 4)(x + 1)$
8. $4(4x + 1)(2x^2 + 3)$
9. $6(2a - 3b)(2a + 3b)$
10. $3(w - 9)(w + 1)$
11. $15(c + 1)(c^2 - c + 1)$
12. $(2x + 5)(x + 2)(x - 2)$
13. $4xy(3x - 4y)(3x + 4y)$
14. $2(n + 16)(2n - 1)$
15. $3(z +)(2z + 3)(2z - 3)$
16. $2(w + 4)(w^2 - 4w + 16)$
17. $(m^2 + n^2)(m + n)(m - n)$
18. $3(2m + 5)(m + 1)$
19. $(7k - 3)(3k + 1)(3k - 1)$
20. $2(k^2 + 4)(k + 2)(k - 2)$
21. $6(2t + 5)(2t + 3)$
22. $(3x^2 + 5)(x^2 + 1)(x + 1)(x - 1)$
23. $2k(k - 2)(k^2 + 2k + 4)$
24. $5(w^4 + 1)(w^2 + 1)(w + 1)(w - 1)$
25. $3(a^3 + 4b^2)(2a^3 - b^2)$
26. $6a^2(5a - 6)(2a^2 - 7)$
27. $3(r^3 + 3y^2)(r^3 - 3y^2)$
28. $(x + 2)(x - 4)(x + 3)$
29. $(x - 8)(x + 3)(x - 2)$
30. $x = 7$ and $x = \frac{1}{3}$
31. $z = -16,\ \mathrm{z} = \frac{1}{2}$
32. $x = -\frac{3}{2}, x = -1,\ x = 1$
33. $a = 0,\ a = -\frac{4}{3},\ a = \frac{4}{3}$
34. $2x, \quad 8x - 5, \quad 8x + 5$
35. $4x^2 - 3x - 4$

Unit 2 Review Answers

1. $4y^3 + 3y^2 + 16$
2. $5a^4 + 3a^3 - a^2 + 5a + 2$
3. $-3x^3 + 17x - 27$
4. $4m^4 - 9m^3 + 14m^2 + 8m - 5$
5. $8x^3 - 20x^2 + 6x - 15$
6. $2x^3 - 4x^2 - 3x + 6$
7. $6x^3 + 7x^2 - 14x - 8$
8. $x^3 + 4x^2 - 49x - 196$
9. $3x^4 + 13x^3 - 12x^2 + 24x - 8$
10. $7x^3(5x^4 - 8)$
11. $5m^3(m^2n + 2)$
12. $3(y + 5x)(y + 3x)$
13. $(2x + 3y)(3x + 2y)$
14. $3x^2(5x + 2)(5x - 2)$
15. $3(3x + 4y)(3x - 4y)$
16. $(2x - 3)(3x + 2)$
17. $(3x - 5)(x + 3)(x - 3)$
18. $(2a - 3)(4a^2 + 3)$
19. $(x^2 + 4)(x + 1)(x - 1)$
20. $(3x - 1)(9x^2 + 3x + 1)$
21. $(x^2 + 2)(x^4 - 2x^2 + 4)$
22. $2(4x + 7y)^2$
23. $-8(x - 3)$
24. $(y - 6)(y + x - 7)$
25. $x = 0, x = -5$
26. $x = \frac{5}{2}, x = -\frac{5}{2}$
27. $x = 0, x = -\frac{3}{4}$
28. $x = -\frac{3}{2}, x = -\frac{2}{3}, x = \frac{2}{3}$
29. $x = -3,\ x = 3$
30. $x^2 - 7x - 13$
31. $2x, \quad x - 6, \quad 3x + 4$