Algebra 2 ~ Lessons 26 – 38

Remember to write the original problem and show all of your steps!
All work should be done on a separate piece of paper.

Lesson 26 – Radical equations (5.8)

Journal 26:

Book: Pg. 307 #5, 7, 9, 15, 19, 23, 25, 31, 37, 39, 43, 45

Assignment 26:

1. Solve by substitution: 7x + y = 9
5x – y = 15

Factor

2. $2y^2 - 242$

3. 8ax – 6x – 12a + 9

Simplify:

4. $27^{\frac{-4}{3}}$

5. $\left(\frac{1}{8}\right)^{\frac{-2}{3}}$

6. Express using rational exponents: $\frac{x^3 y}{y^{\frac{1}{2}} x^{\frac{1}{3}}}$

7. Express in simplest radical form: $x^{\frac{2}{3}} x^{\frac{1}{5}}$

Book: Pg. 887 (5-5) #16, 23
Pg. 887 (5-6) #8, 9,12, 15, 17, 20
Pg. 314 #8, 20, 26, 32, 46
Pg. 320 #24, 28, 30, 36, 52

Lesson 27 – Solving equations on your calculator

Journal 27:

Solve on your calculator. Round answers to 3 decimals when needed

1. $\frac{1}{4}(x^2 - 10x + 17) = 0$

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

3. $2x^3 - x^2 - 18x + 9 = 0$

4. $x^4 = 2x^3 + 1$

5. $x^4 - x^3 + x - 1 = 0$

6. $x^4 + 5x^2 - 36 = 0$

7. $2x + 9\sqrt{x} - 5 = 0$

8. $-\sqrt{26 - 11x} + 4 = x$

9. $\sqrt{7x + 36} - \sqrt{5x + 16} = 2$

10. $|x + 1| = x^2 - 5$

Find the zeros (or roots) of the equations

11. $y = 27 - 4x - 12$

12. $y = \frac{3}{2}x + \frac{1}{4}(x - 2) - 10$

13. $y = 3(x + 3) - 5(1 - x) - 1$

14. $y = \sqrt{x + 3} + \sqrt{x - 1} - 5$

15. $y = \sqrt{x + 5} + \sqrt{x + 10} - 2$

Journal 27 answers:

1. x = 2.172, 7.828

2. x = -1.379

3. x = 0.5, -3, 3

4. x = -0.717, 2.107

5. x = 1, -1

6. x = -2, 2

7. x = .25

8. x = 2, -5

9. x = 0, 4

10. x = -2.562, 3

11. x = 3.75

12. x = 6

13. x = -.625

14. x = 5.41

15. x = -4.938

Assignment 27:

1. Solve by elimination: $\frac{2}{7}x - \frac{4}{3}y = 16$

$\frac{4}{7}x + \frac{8}{3}y = -16$

Simplify

2. $\sqrt{128a^4b^3}$ **3.** $(2\sqrt{12})(\sqrt{32})$ **4.** $\frac{\sqrt{3}+2}{\sqrt{3}-5}$

5. Simplify: $(\frac{1}{32})^{\frac{2}{5}}$

6. Express using rational exponents: $(-2a^{\frac{3}{4}})(5a^{\frac{3}{2}})$

7. Express in simplest radical form: $m^{\frac{1}{3}}x^{\frac{3}{4}}y^{\frac{5}{6}}$

Book: Pg. 279 #44, 64
Pg. 307 #55, 56
Pg. 314 #22, 28, 38, 56
Pg. 319 #22, 26, 32, 34, 54
Pg. 307 #4, 8, 16, 18, 36

Lesson 28 – function notation, vertex of parabola, solving quadratics on the calculator (2.1, 6.1)

Journal 28:

Book: Pg. 68 #35 – 41 odd
Pg. 338 #9, 11, 13, 23 – 41 odd

Assignment 28:

No calculator
Simplify:

1. $\frac{5x^{-3}y^2z^{-4}}{15x^2y^5z^{-9}}$ **2.** $(3+\sqrt{2})(4+\sqrt{2})$ **3.** $\frac{4}{2\sqrt{3}}$

4. Express using rational exponents: $(4a^3b^4)^{\frac{3}{2}}$

5. Express in simplest radical form: $x^{\frac{1}{3}}y^{\frac{3}{4}}z^{\frac{7}{6}}$

Simplify:

6. $(7 + 6i)(4 - 2i)$ **7.** $\frac{8+5i}{4i}$ **8.** $\frac{2+i}{3-i}$ **9.** $\frac{3+2i}{5-3i}$

May use calculator

10. Solve. (linear programming)

A pet supply company mixes two brands of dry dog food. Brand X costs $15 per bag and contains 8 units of nutritional element A, 1 unit of nutritional element B, and 2 units of nutritional element C. Brand Y costs $30 per bag and contains 2 units of nutritional element A, 1 unit of nutritional element B, and 7 units of nutritional element C. Each bag of dog food must contain at least 16 units, 5 units, and 20 units of nutritional elements A, B, and C, respectively. Find the number of bags of brands X and Y that should be mixed to produce a mixture meeting the minimum nutritional requirements and having a minimum cost per bag.

Solve on your calculator. Round answers to 3 decimals

11. $-2(x^2 - 6x + 6) = 0$ **12.** $x^4 + 2x^3 - 8x - 16 = 0$ **13.** $x + \sqrt{31 - 9x} = 5$

Find the zeros (or roots) of the equations

14. $y = 3.5x - 8 - .5x$ **15.** $y = .6x + .4(100 - x) - 50$

Book:(no calculator) **Pg. 315** #36, 40, 42, 58
Pg. 307 #14, 20, 24, 34, 44

Lesson 29 – Solve quadratics by factoring (6.2)

Journal 29:

Book: Pg. 344 #5, 11 – 33 odd
Pg. 363 #17 – 23 odd

Assignment 29:

No Calculator

1. Solve: 4 + | 2x + 1 | < 7

Simplify

2. $3\sqrt{50}$ - $4\sqrt{18}$ + $2\sqrt{9}$ **3.** $\frac{5}{\sqrt{3}}$

Use calculator for numbers 4-10:
Solve on your calculator. Round answers to 3 decimals

4. $\frac{1}{9}x^3 + x + 4 = 0$ **5.** | x – 10 | = $x^2 - 10x$ **6.** 6x - $7\sqrt{x}$ – 3 = 0

Find the zeros (or roots) of the equations

7. y = $x^5 - 2x^3 - 3$ **8.** y = $4x^3 + 12x^2 - 26x - 24$

Find the vertex of the parabolas

9. f(x) = $x^2 + 12x + 36$ **10.** h(x) = x^2 + 4

Book: (no calculator) Pg. 325 #59, 61, 65, 66, 68, 72, 74, 79, 82 – 85
Pg. 69 #34, 36, 40

Assignment 29 answers:

1. -2 < x < 1 **3.** $\frac{5\sqrt{3}}{3}$ **5.** x = -1, 10 **7.** x = 1.638 **9.** Vertex (-6, 0)

Pg. 325 #68. t = 18 **74.** $2m^2i$ **Pg. 69 #36.** $\frac{-2}{9}$

TEST 7 ~ last day to turn in lessons 25-29

Lesson 30 – Solving by completing the square (6.3)

Journal 30:

Book: Pg. 350 #7, 11 – 31 odd

Assignment 30:

No Calculator

1. Solve: | 3x + 4 | = 1

2. Write the equation of a line in slope-intercept form:
Slope = $\frac{1}{5}$ and passes through the point (5, 2)

3. Write using rational exponents: $(x^{-5}y^3z^{10})^{\frac{-3}{5}}$

Simplify

4. $(4 + i)(4 - i)$

5. $(\sqrt{-6})(\sqrt{-15})$

6. $\frac{2+7i}{-5i}$

7. $\frac{(1-2i)^2}{(2-i)^2}$

Solve using your calculator – round answers to 3 decimals

8. $(x+1)^2 + 2(x-2) = (x+1)(x-2)$

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

10. 1.8x - 6$\sqrt{x}$ - 5.6 = 0

11. $|x^2 - 3| = 2x$

12. Use your calculator to find the vertex of the parabola: h(x) = $x^2 - 10x + 27$

Book: Pg. 307 #12, 26(change to =), 38, 46
Pg. 116 #16 - 19
Pg. 344 #12, 18, 22
Pg, 363 #18, 22

~~Lesson 31 – Solving by quadratic formula (6.4)~~

Journal 31:

Find the value of the discriminant and describe the nature of the roots

1. $3x^2 - 5x - 2$ **2.** $x^2 + 7 = -5x$ **3.** $4x^2 = -25 + 20x$

4. $3x^2 + 9x - 2 = 0$ **5.** $x^2 = 3x$

Book: Skip instructions, just solve by quadratic formula: Pg. 357 #11, 13, 17 – 29 odd

Journal 31 answers:

1. 49, 2 rational **2.** -3, 2 complex **3.** 0, 1 rational

4. 105, 2 irrational **5.** 9, 2 rational

Assignment 31:

No Calculator

Simplify

1. $x^{-8}y^{10}(x^{11}y^{-8} + x^{10}y^{-6})$ **2.** $\frac{3}{6-2i}$

3. $\frac{5+3i}{1+i}$

Solve

4. $\sqrt{3x-5} - 3 = 1$ **5.** $d + \sqrt{d^2 - 8} = 4$

6. Define 2 variables, write equations, solve by any method, and label your answers correctly. You may use a calculator.

Josh scored 25 points in the basketball game. He had twice as many 2 point baskets as 1 point free throws. How many baskets and free throws did he make?

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Solve using your calculator – round answers to 3 decimals.

7. $x^2 + 6x - 3 = 0$ **8.** $12x^3 - 84x^2 + 120x = 0$

9. $5\sqrt{x} - \sqrt{x-1} = 6$ **10.** $\sqrt{3x-2} = 4 - x$

Book: (no calculator) **Pg. 344** #16, 20, 24, 26, 32, 46
Pg. 350 #6, 8, 10, 18, 28
Pg. 339 (use calculator) #22, 32, 34, 36

Lesson 32 – solving quadratic inequalities (6.7)

Journal 32:

Book: (no calculator) **Pg. 381** #21, 23, 39 – 47 odd, 55

Solve on your calculator – round answers to 2 decimals, show work

1. $4x^2 - 9 \leq -4x$ **2.** $-0.5x^2 + 12.5x + 1.6 > 0$ **3.** $x^2 + 5 \leq 0$

4. $\frac{1}{2}a^2 - 2a + 1 \geq 7$ **5.** $x^3 - x^2 - 16x + 16 \leq 0$

Journal 32 answers:

1. $-2.08 \leq x \leq 1.08$ **2.** -0.13 < x < 25.13 **3.** No solution

4. $a \leq -2 \text{ or } a \geq 6$ **5.** $x \leq -4 \text{ or } 1 \leq x \leq 4$

Assignment 32:

No calculator

1. Solve by graphing: 5x – 7y < 14
2x + 5y < 25
y < 3x – 2

2. Factor: $162x^6 - 98$

(Continued on next page…)

3. Express using rational exponents: $y^{\frac{4}{5}}y^{\frac{5}{2}}$

Find each value if g(x) = $\frac{x^2+1}{4+x}$

4. g(5) **5.** g(-2) **6.** g(7c)

Find the value of the discriminant and describe the nature of the roots

7. $-2x^2 + x - 5$ **8.** $2x^2 - 7 = -3x$

Use your calculator to find the zeros (or roots) of the equations in # 9 and 10.

9. y = | 2x + 3 | - 7 **10.** $y = 6 + 2x\sqrt{3}$

Book: (no calculator) **Pg. 325** #70, 71
Pg. 344 #14, 28
Pg. 363 #20, 24, 47(calculator)
Pg. 350 #12, 20, 22, 24, 32
Pg. 357 (solve by quadratic formula) #10, 12, 16

Assignment 33:

No calculator:

1. **Simplify:** $\sqrt{108} - \sqrt{48} + (\sqrt{3})^3$
2. **Factor:** $7mx^2 + 2nx^2 - 7my^2 - 2ny^2$
3. **Solve:** $13 - \sqrt{3x + 7} = 6$
4. For p(x) = $2x^2 + 6x - 8$ **find:** p(-1)
5. For f(x) = 2x – 3 **find:** f(x + h)

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6. **Find the value of the discriminant and describe the nature of the roots**
   $6x^2 - 5x + 1 = 0$

Use your calculator to find the zeros (or roots) of the equations

7. $y = x^3 - 2x^2 + 6$ **8.** $y = x^2 + 8x - 84$

Solve on your calculator – round answers to 2 decimals, show work

9. $-1.2x^2 + 4.8x - 22 < 0$ **10.** $\frac{1}{8}x^3 - \frac{1}{2}x \geq 0$

Book: (no calculator) Pg. 400 #17, 20, 21, 25 – 28, 31, 32, 34, 35, 40
Pg. 382 #40, 50, 52

Assignment 33 answers:

1. $5\sqrt{3}$ **3.** x = 14 **5.** f(x + h) = 2x + 2h – 3

7. x = -1.34 **9.** x < .53 or x > 3.47

Pg. 382 #50. All reals

TEST 8 ~ Last day to turn in assignments 31-33.

SEMESTER FINAL ~ Covers everything learned so far!

Lesson 34 – Multiply and divide rational expressions (9.3)

Journal 34:

Book: Pg. 565 #5 – 39 odd

Assignment 34: _____

1. Solve: $|1 - 2x| < \frac{1}{2}$

2. Write the equation of the line, in slope-intercept form:
m = $\frac{1}{5}$ and passing through the point (5, 2)

3. Simplify: $\frac{p^2m^5p^{-3}(2p)^{-3}}{m^6(m^{-2})^2mp^3}$

4. Simplify: (3x – 1)(2x^2 - x + 1)

5. Factor: 100m^8 – 9

Simplify

6. $\sqrt{128a^4b^3}$ **7.** $\frac{9+12i}{8+3i}$ **8.** $16^{\frac{5}{4}}$

Solve by completing the square

9. $h^2 - 4h - 7 = 0$ **10.** $x^2 + 19x - 12 = 0$

Book: (Calculator) Pg. 352 #46
Pg. 339 #38, 40
(No Calculator) Pg. 400 #19, 23, 24
Pg. 357 #18 – 24 even (solve by quadratic formula)
Pg. 381 #20, 42, 44, 54

Lesson 35 – Add and subtract rational expressions (9.4)

Journal 35:

Book: Pg. 573 #5 – 11 odd, 15 – 31 odd, 37, 39

Assignment 35:

1. Solve by substitution or elimination: 2x – 4y = 14
-3x + y = -21

(Continued on next page…)

2. Simplify: $(1 + 8i) - (5 - 4i)$

3. Solve: $\sqrt[3]{2x+3} - 3 = -1$

4. p(x) = $\frac{2}{3}x^2 + 5x$ Find: p(5)

5. h(x) = $\frac{x^2+5x-6}{x+3}$ Find: h(a – 1)

Solve using your calculator, round to 2 decimals – show work

6. -$x^2 - 5x - 6 > 0$ **7.** 13x - 28$x^2 + 6 < 0$

Book: **Pg. 400** #22, 33, 39
Pg, 889 (6-3) #12, 15, 20, 30
Pg. 890 (6-4)(solve by quadratic formula) #2, 13, 14
Pg. 891 (6-7) #12, 16, 18
Pg. 566 #8, 12, 14, 30, 40

Lesson 36 – Solving rational equations (9-5)

Journal 36:

Book: **Pg. 581** #7, 9, 13, 15, 19, 23, 25, 27
Pg. 898 (9-5) #5 – 8

Journal 36 answers:

Pg. 898 #5. No solution **6.** x = 1, 4 **7.** x = -3, -1 **8.** x = 1

Assignment 36:

1. Simplify: $\frac{a^0a^2(ab^{-2})^{-2}a}{ba(a^2b^3)^{-3}b^2}$

Solve by factoring

2. $3x^2 - 11x - 4 = 0$

3. $4x^2 + 2x - 6 = 0$

(Continued on next page…)

Solve by completing the square

4. $x^2 + 9x = -25$

5. $2x^2 + 5x - 3 = 0$

Solve by quadratic formula

6. $4x^2 - 6x - 3 = 0$

7. $x^2 + 5x + 8 = 0$

8. $4x^2 + 8x + 3 = 0$

9. $9a^2 - 30a + 25 = 0$

10. Define 2 variables, write equations, solve by any method, and label your answers correctly. You may use a calculator.

Grandma's age is 8 years less than 7 times Stephanie's age. The sum of their ages is 95. Find the age of each.

11. Solve on your calculator: | 2x + 3 | = 7

Solve using your calculator, round to 2 decimals – show work

12. $x^2 + 3x + 4 > 0$

13. $x^3 - 2x^2 - 5x + 6 \leq 0$

Book: Pg. 382 #38, 48
Pg. 566 #18, 24, 26, 32, 38
Pg. 573 #8, 10, 12, 20, 32

Lesson 37 – Functions, domain and range (2.1)

Journal 37:

Book: Pg. 68 #7, 9, 17 – 27 odd

(Continued on next page…)

Do the following represent functions?

1. $x^2 + y^2 = 4$

2. $x^2 + y = 4$

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

4. $y^2 = x^2 - 1$

Find the domain and range of each function (you may use your calculator)

5. f(x) = |x – 2 | + 3

6. f(x) = 4 - x^2

7. g(x) = 5x – 9

8. h(x) = $\sqrt{x-1}$

9. f(x) = $\sqrt{25 - x^2}$

Journal 37 answers:

1. Not function **2.** Function **3.** Function **4.** Not function

5. Domain: all reals, Range: $y \geq 3$
6. Domain: all reals, Range: $y \geq 4$
7. Domain: all erals, Range: all reals
8. Domain: $x \geq 1$ Range: $y \geq 0$
9. Domain: $-5 \leq x \leq 5$ Range: $0 \leq y \leq 5$

Assignment 37:

1. Factor: $y^3 + 64$

2. Solve: $\sqrt{3f + 1} - 2 = 6$

3. Solve by factoring: $8b^2 + 10b = 3$

Solve by completing the square

4. $x^2 + 20x + 75 = 0$

5. $3x^2 + 5x + 6 = 0$

Solve by quadratic formula

6. $n^2 = 8n - 16$

7. $x^2 - x + 1 = 0$

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Solve

8. $x^2 - 5x - 6 < 0$

9. $x^2 + 8x - 9 > 0$

Solve using your calculator, round to 2 decimals – must show work

10. $2x^2 > 25$

11. $x^3 - 5x^2 + 3x + 1 \geq 0$

Book: Pg. 566 #20, 34, 36
Pg. 568 self test #10

Pg. 573 #22, 24, 26, 28, 30
Pg. 581 #8, 10, 14, 22, 30

Lesson 38 – combinations and compositions of functions

Journal 38:

Find (f + g)(x), (f – g)(x), (fg)(x), (f/g)(x) for each set of functions

1. f(x) = 2x – 5
g(x) = 1 - x

2. f(x) = x^2 + 1
g(x) = x – 4

Book: Pg. 523 #9, 11, 21, 25 – 39 odd

Journal 38 answers:

1. (f + g)(x) = x – 4
(f – g)(x) = 3x – 6
(fg)(x) = $-2x^2 + 7x - 5$
(f/g)(x) = $\frac{2x-5}{1-x}$

2. (f + g)(x) = $x^2 + x - 3$
(f – g)(x) = $x^2 - x + 5$
(fg)(x) = $x^3 - 4x^2 + x - 4$
(f/g)(x) = $\frac{x^2+1}{x-4}$

Assignment 38:

1. Write the equation of the line, in slope-intercept form:
passing through the points (3, 5) and (8, 7)

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2. Simplify: (3 + 4i)(5 – 2i)

3. Solve by completing the square: $x^2 - 6x + 11$

Solve by quadratic formula

4. $5x^2 - 5x + 4 = 0$

5. $18x^2 = 6x^2 + 5$

6. Solve: $2m^2 - m < 1$

7. Solve using your calculator, round to 2 decimals – show work:
$2x^2 + 3 \leq 8x$

8. Does the following represent a function: $x + y^2 = 4$

Find the domain and range of each function. You may use your calculator.

9. f(x) = | x + 3 | - 2

10. f(x) = $\sqrt{49 - x^2}$

Book: Pg. 587 #22, 24, 25, 27, 29, 31, 32, 33, 36 – 40
Pg. 69 #18, 26

Assignment 38 answers:

1. y = $\frac{2}{5}x + \frac{19}{7}$ **3.** $x = 3 \pm i\sqrt{2}$ **5.** $x = \pm \frac{\sqrt{15}}{6}$

7. $.42 \leq x \leq 3.58$ **9.** Domain: all reals Range: $y \geq -2$

Pg. 69 #26. Domain {-2, 3}, Range {5, 7, 8}, not a function

TEST 9 ~ Last day to turn in assignments 35-38.