Review for MAT 99 Final (Martin - 3rd Ed)

Chapter 6

1. Factor: $y^2+4y-32$ ans: $(y+8)(y-4)$
2. Factor: $15x^2+6x-5xz-2z$ ans: $(5x+2)(3x-z)$
3. Factor: $2x^2+10x+12$ ans: $2(x+3)(x+2)$
4. Factor: $4z^2-15z+9$ ans: $(4z-3)(z-3)$
5. Factor: $4y^2-49$ ans: $(2y+7)(2y-7)$
6. Factor: $64x^3+27$ ans: $(4x+3)(16x^2-12x+9)$
7. Factor: y^3-8 ans: $(y-2)(y^2+2y+4)$
8. Solve by factoring: $x^2+3x=10$ ans: $\{-5, 2\}$

Chapter 7

1. Find any real numbers for which $\dfrac{9x^3+4x}{15x+45}$ is undefined. ans: -3

2. Simplify: $\dfrac{x^2-3x+2}{x^2-8x+15}\cdot\dfrac{x^2+x-12}{x^2+2x-8}$ ans: $\dfrac{x-1}{x-5}$

3. $\dfrac{6x^2y^4}{35a^2b^5}\div\dfrac{12x^3y^3}{7a^4b^5}$ ans: $\dfrac{a^2y}{10x}$

4. Simplify: $\dfrac{x+1}{x^2+x-6}-\dfrac{x+2}{x^2+4x+3}$ ans: $\dfrac{2x+5}{(x+3)(x+1)(x-2)}$

5. Simplify: $\dfrac{2+\dfrac{6}{x}}{1-\dfrac{9}{x^2}}$ ans: $\dfrac{2x}{x-3}$

6. Solve: $\dfrac{5}{y+3}-2=\dfrac{7}{y+3}$ ans: -4

7. Twelve divided by the sum of a number and 2 equals the quotient of 4 and the difference of the number and 2. Find the number. ans: 4

8. Eric can mow the lawn in 12 min, Dan can mow it in 15 min and Sam in 20 min. How fast can they mow the lawn working together? ans: 5 min

9. A car travels 90 miles in the same time that a truck traveling 10 miles per hour slower travels 60 miles. Find the speed of the car and the truck. ans: 30 and 20 mph

Chapter 8

1. Find the equation of the line that contains the point (4, -5) and has slope 2. ans: y = 2x - 13

2. Find the equation of the line that contains the point (3, -2) and is parallel to the line y = -3x + 4. ans: y = -3x + 7

3. Find the equation of the line that contains the point (2, 5) and is perpendicular to the line $y=-\dfrac{2}{3}x+6$. ans: $y=\dfrac{3}{2}x+2$

4. Find g(-6) where $g(x)=\dfrac{x^2+2x}{x+3}$ ans: -8

5. Find the domain of $g(x)=\dfrac{x^2+2x}{x+3}$ ans: {x | x is a real number and x ≠ -3}

6. What is the domain of a) $f(x)=\dfrac{1}{3x+5}$? ans: {x | x is a real number and x ≠ -5/3}

b) f(x) = x^2 +7x - 6 ? ans: {x | x is a real number}

Chapter 4

1. Solve: 3x + 4y = 14
   2x + y = 1 ans: (-2,5)

2. Solve: x = 3y + 1
   x - 2y = 6 ans: (16,5)

3. The sum of two numbers is 124 and their difference is 32. Find the numbers. ans: 78 and 46

4. Two trains are 250 mi apart and are traveling toward each other.
   One train is traveling 5 mph faster than the other train.
   The trains pass each other in 2 hr. Find the speed of each train. ans: 60, 65 mph

5. Eric is preparing 15 liters of a 25% saline solution. He has two other saline solutions with strengths of 40% and 10%. Find the amount of 40% solution and the amount of 10% solution he should mix to get 15 liters of 25% solution. ans: 7.5 liters and 7.5 liters

6. If y varies directly as x, find the direct variation equation if y = 68 when x = 17. ans: y = 4x (sec 9.4)

Chapter 10

1. Simplify: $(b^{-2/3}\cdot b^{1/4})^{-4/3}$ ans: $b^{5/9}$

2. Simplify: $\dfrac{x^{-3/5}}{x^{1/5}}$ ans: $\dfrac{1}{x^{4/5}}$

3. Simplify: $\left(\dfrac{x^{1/2}y^{-5/4}}{y^{-3/4}}\right)^{-4}$ ans: $\dfrac{y^2}{x^2}$

4. Simplify: $\sqrt{24a^9b^6}$ ans: $2a^4b3\sqrt{6a}$

5. Simplify: $\sqrt[3]{8a^5b^8c^{10}}$ ans: $2ab^2c^3\sqrt[3]{a^2b^2c}$

6. Simplify: $2\sqrt[3]{3a^4}-3a\sqrt[3]{81a}$ ans: $-7a\sqrt[3]{3a}$

7. Simplify: $\sqrt[3]{4a^2b^3}\ \sqrt[3]{8ab^5}$ ans: $2ab^2\sqrt[3]{4b^2}$

8. Simplify: $\sqrt{2x}(\sqrt{8x}-\sqrt{32})$ ans: $4x-8\sqrt{x}$

9. Simplify: $\dfrac{\sqrt{42a^3b^5}}{\sqrt{14a^2b}}$ ans: $b^2\sqrt{3a}$

10. Simplify: $\dfrac{5}{\sqrt{3}-2}$ ans: $-10-5\sqrt{3}$

11. Solve: $\sqrt{3x+9}-12=0$ ans: 45

12. Solve: $\sqrt[3]{x-4}+7=5$ ans: -4

Chapter 11

1. Use the square root property to solve: $(y-3)^2=4$ ans: $\{1, 5\}$
2. Use the quadratic formula to solve: $b^2+11b-12=0$ ans: $\{-12, 1\}$
3. Graph: $f(x)=(x-2)^2+5$. ans: see # 13, p 781.
4. Solve: $-2x\le -4$ (sec 2.7) ans: $x\ge 2$

Updated Dec 09