

Review for MAT 99 Final (Martin - 3rd/4th Ed)

Chapter 6

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

Chapter 7

- Find any real numbers for which $\frac{9x^3 + 4x}{15x + 45}$ is undefined. ans: -3
- Simplify: $\frac{x^2 - 3x + 2}{x^2 - 8x + 15} \cdot \frac{x^2 + x - 12}{x^2 + 2x - 8}$ ans: $\frac{x-1}{x-5}$ 3. $\frac{6x^2y^4}{35a^2b^5} \div \frac{12x^3y^3}{7a^4b^5}$ ans: $\frac{a^2y}{10x}$
- Simplify: $\frac{x+1}{x^2+x-6} - \frac{x+2}{x^2+4x+3}$ ans: $\frac{2x+5}{(x+3)(x+1)(x-2)}$
- Simplify: $\frac{2+\frac{6}{x}}{1-\frac{9}{x^2}}$ ans: $\frac{2x}{x-3}$ 6. Solve: $\frac{5}{y+3} - 2 = \frac{7}{y+3}$ ans: -4
- 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
- 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
- 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

- Find the equation of the line that contains the point (4, -5) and has slope 2. ans: $y = 2x - 13$
- Find the equation of the line that contains the point (3, -2) and is parallel to the line $y = -3x + 4$. ans: $y = -3x + 7$
- Find the equation of the line that contains the point (2, 5) and is perpendicular to the line $y = -\frac{2}{3}x + 6$. ans: $y = \frac{3}{2}x + 2$
- Find $g(-6)$ where $g(x) = \frac{x^2 + 2x}{x+3}$ ans: -8

5. Find the domain of $g(x) = \frac{x^2 + 2x}{x + 3}$ ans: $\{x \mid x \text{ is a real number and } x \neq -3\}$

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

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

Chapter 4

1. Solve: $\begin{cases} 3x + 4y = 14 \\ 2x + y = 1 \end{cases}$ ans: (-2,5) 2. Solve: $\begin{cases} x = 3y + 1 \\ x - 2y = 6 \end{cases}$ 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: $\frac{x^{-3/5}}{x^{1/5}}$ ans: $\frac{1}{x^{4/5}}$

3. Simplify: $\left(\frac{x^{1/2} y^{-5/4}}{y^{-3/4}}\right)^{-4}$ ans: $\frac{y^2}{x^2}$ 4. Simplify: $\sqrt{24a^9 b^6}$ ans: $2a^4 b^3 \sqrt{6a}$

5. Simplify: $\sqrt[3]{8a^5 b^8 c^{10}}$ ans: $2ab^2 c^3 \sqrt[3]{a^2 b^2 c}$ 6. Simplify: $2\sqrt[3]{3a^4} - 3a\sqrt[3]{81a}$ ans: $-7a\sqrt[3]{3a}$

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

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

9. Simplify: $\frac{\sqrt{42a^3 b^5}}{\sqrt{14a^2 b}}$ ans: $b^2 \sqrt{3a}$ 10. Simplify: $\frac{5}{\sqrt{3} - 2}$ 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: $-2x \leq -4$ (sec 2.7) ans: $x \geq 2$