

MATH 110 Review Problem Set 0.1

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The following problems, based on the *Review of Algebra and Inequalities* PDF document posted to the course site, will help you review. *You do not need to hand in solutions to these problems.*

1. (Based on Algebra.1–12) Expand and simplify.

(a) $7(t^2 - 1) - 2(t + 3) - 5t(t - 4)$

(b) $x(x - 2)^2$

2. (Based on Algebra.17–26) Simplify.

(a) $\frac{1}{x+2} + \frac{1}{x-1}$

(b) $\frac{x/a}{y/b}$

3. (Based on Algebra.29–41) Factor the expression.

(a) $5ax - 35ax^2$

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

4. (Based on Algebra.49–51) Simplify the expression.

(a) $\frac{x^2 + 2x - 3}{x^2 - 9}$

(b) $\frac{5x^2 + 9x - 2}{10x^2 - 17x + 3}$

5. (Based on Algebra.55–60) Complete the square.

(a) $x^2 + 6x - 10$

(b) $3x^2 - 18x + 7$

6. (Based on Algebra.61–66) Solve the equation.

(a) $x^2 + x - 6 = 0$

(b) $3x^2 - 7x + 3 = 0$

7. (Based on Algebra.69–72) Which of the quadratics are irreducible?

(a) $5x^2 - 8x + 4$

(b) $7x^2 + 3x - 3$

8. (Based on Algebra.77–82) Simplify the radicals.

(a) $\sqrt{45}\sqrt{20}$

(b) $\frac{\sqrt{32x^4}}{\sqrt{2}}$

9. (Based on Algebra.83–100) Use the Laws of Exponents to simplify.

(a) $\frac{a^2 \times a^{2n-2}}{a^{n+1} \times a^{n-1}}$

(b) $\frac{x^{-1} + y}{x + y^{-1}}$

10. (Based on Algebra.101–106) Rationalize the denominator.

(a) $\frac{1}{2 - \sqrt{5}}$

(b) $\frac{4}{\sqrt{2+h} - \sqrt{2-h}}$

11. (Based on Algebra.13–16) Expand and simplify.

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

(b) $(1-2x+x^2)^2$

12. (Based on Algebra.27–28) Simplify.

(a) $\frac{1 + \frac{1}{x-1}}{1 + \frac{1}{x+1}}$

(b) $1 - \frac{1}{1 - \frac{1}{1-x}}$

13. (Based on Algebra.42–48) Factor.

(a) $x^3 - 8$

(b) $x^3 + 4x^2 - 11x - 30$

14. (Based on Algebra.52–54) Simplify the expression.

(a) $\frac{x^3 + x^2 - 6x}{3x^2 - 8x + 4}$

(b) $\frac{x}{x-1} + \frac{1}{x^2 - 6x + 5}$

15. (Based on Algebra.67–68) Solve the equation.

(a) $x^3 - 3x + 2 = 0$

(b) $x^3 - 6x^2 + 8x - 3 = 0$

16. (Based on Algebra.73–76) Use the binomial theorem to expand the expression.

(a) $(x+y)^5$

(b) $(x^2 - 1)^3$

17. (Based on Algebra.107–108) Rationalize the expression.

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

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

You may find the following additional exercises from the *Review of Algebra and Inequalities* PDF document posted to the course site helpful.

Algebra C-level: 1–12, 17–26, 29–41, 49–50, 55–66, 69–72, 77–106;

B-level: 13–16, 27–28, 42–48, 51–54, 67–68, 73–76, 107–116