

## MATH 11012 ALGEBRA REVIEW PROBLEMS

### Section 1

Find the product.

- $(4x - 7)(3x + 2)$
- $(3x + 2)(3x - 2)$
- $(2x + 3)(x^2 - 5x + 7)$
- $(2x - 3y)(2x + 3y)$
- $(4x - 3)(2x^2 - 3x - 1)$
- $(3x + 4y)^2$
- $(x + 1)(x - 2)(x + 3)$
- $3y(2y - 3)(y + 2)$
- $(3x + 5)(x - 2)^2$
- $x(x + 1)(x + 2)$
- $x^2(x - 2)(2x - 1)$
- $(x + 2)^3$
- $(x - 3)^3$
- $(3x + 2)^3$
- $(2x - 1)^3$
- $(x + 2y)^3$

### Section 2

Factor completely.

- $x^2 - 16$
- $4x^2 - 25$
- $x^2 - 7x + 12$
- $x^2 + 4x - 12$
- $2x^2 - 7x - 15$
- $3x^2 - x - 2$
- $10x^2 - 33x - 7$
- $4x^2 - 12x + 9$
- $12x^2 + 5x - 2$
- $9x^2 + 30x + 25$
- $3x^2 + 12x - 36$
- $2x^2 + 2x - 24$
- $5x^2 + 5x - 10$
- $3x^2 - 3x - 18$
- $10x^2 - 50x - 240$
- $3x^3 - x^2 - 2x$

- $2x^3 - x^2 - x$
- $12x^3 + 7x^2 + x$
- $3x^3 - 5x^2 + 2x$
- $x^3 - 5x^2 + 6x$
- $x^3 - 1$
- $x^3 - 8$
- $x^3 + 1$
- $x^3 + 8$
- $27x^3 + 8$
- $8x^3 - 27$
- $1 - 64x^3$
- $x^3 - 8x^2 + 2x - 16$
- $x^3 - 3x^2 + 7x - 21$
- $3x^3 + x^2 + 15x + 5$
- $2(x + 5)^2 - 3(x + 5)$
- $5(x + 7)^2 - 3x(x + 7)$
- $3x(x - 2) + 5(x - 2)^2$
- $2x(x + 1) + 7(x + 1)^2$

### Section 3

Simplify the given expression.

$$1. \frac{\frac{x+1}{x}}{\frac{x-1}{2x}}$$

$$2. \frac{\frac{8x-24}{10}}{\frac{x-3}{5x}}$$

$$3. \frac{\frac{10x-5y}{12}}{\frac{2x-y}{6y}}$$

$$4. \frac{\frac{1}{4} + \frac{5}{x}}{\frac{x+5}{20}}$$

$$5. \frac{\frac{1}{5} + \frac{5}{x}}{\frac{x+7}{35}}$$

$$6. \frac{\frac{1}{7} + \frac{5}{x}}{\frac{x+7}{21}}$$

$$7. \frac{\frac{1}{6} + \frac{4}{x}}{\frac{x+9}{42}}$$

$$8. \frac{\frac{5}{x} - 6}{\frac{3}{x^2} + 1}$$

$$9. \frac{\frac{3}{x} - 2}{\frac{4}{x^2} + 3}$$

$$10. \frac{\frac{5}{x^2} - 1}{\frac{3}{x} + 2}$$

$$11. \frac{3 - \frac{2}{x}}{8 - \frac{5}{x^2}}$$

$$12. \frac{\frac{x}{2} + \frac{3x}{4}}{5}$$

$$13. \frac{\frac{1}{x+h} - \frac{1}{x}}{h}$$

$$14. \frac{\frac{1}{x} - \frac{1}{2}}{x - 2}$$

$$15. \frac{\frac{1}{x^2} - \frac{1}{9}}{x - 3}$$

$$16. \frac{\frac{1}{(x+h)^2} - \frac{1}{x^2}}{h}$$

$$17. \frac{\frac{x+h}{x+h+1} - \frac{x}{x+h}}{h}$$

### Section 4

Solve for  $x$ .

$$1. 6x^2 + 3x = 0$$

$$2. x^2 - 2x - 8 = 0$$

$$3. x^2 + 10x + 25 = 0$$

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

$$5. 9x^2 - 1 = 0$$

$$6. x^2 + 14x + 44 = 0$$

$$7. x^2 - 10x + 9 = 0$$

$$8. 16x^2 + 56x + 49 = 0$$

$$9. 2x^2 = 19x + 33$$

$$10. x^2 + 8x - 4 = 0$$

$$11. 12x - 9x^2 = -3$$

$$12. x^2 + 6x + 2 = 0$$

$$13. x^2 + 8x + 14 = 0$$

$$14. 9x^2 - 12x - 14 = 0$$

$$15. 36x^2 + 24x - 7 = 0$$

$$16. 4x^2 + 4x = 7$$

$$17. (x - 5)^2 = 2x$$

$$18. 3x^4 = 48x^2$$

$$19. x^3 - 3x^2 - 3x + 9 = 0$$

$$20. x^4 - 3x^2 + 2 = 0$$

$$21. \sqrt{2x+7} - x = 2$$

$$22. \sqrt{2x} - 10 = 0$$

$$23. x = \sqrt{11x - 30}$$

$$24. \frac{2}{x} = \frac{3}{x-2} - 1$$

$$25. \frac{1}{x} - \frac{1}{x+1} = 3$$

$$26. \frac{20-x}{x} = x$$