

MAT 0024: Elementary Algebra (Mediated Learning)

Final Exam Practice

1. Simplify: $8 - 4 \div 2 - 10 \div 2$

- (a) 4 (b) 1
(c) -3 (d) -4

2. Simplify: $18 + 3 \cdot 2 \div 6$

- (a) 19 (b) 18
(c) 7 (d) 4

3. Simplify: $12 - (-3)^2 \div (7 - 4)$

- (a) 1 (b) 7
(c) 9 (d) 15

4. Simplify: $(6 - 2)^2 \div 4$

- (a) 8 (b) 4
(c) 2 (d) 1

5. $|15| + |-3| - |17| =$

- (a) -5 (b) 1
(c) 29 (d) 35

6. $|-8| - |-5| =$

- (a) -13 (b) -3
(c) 3 (d) 13

7. Simplify: $-2x + 3(x + 2) + 1$

- (a) $5x + 7$ (b) $5x + 3$
(c) $x + 7$ (d) $x + 3$

8. Simplify: $-2[x + 9(x + 1)]$

- (a) $20x + 18$ (b) $20x + 2$
(c) $-20x - 2$ (d) $-20x - 18$

9. Evaluate: $3w^2 + 5w - 8$ when $w = -2$.
- (a) 14 (b) -6
(c) -11 (d) -30
10. Evaluate $2ab - c$ when $a = -3$, $b = 2$, and $c = -1$.
- (a) 19 (b) 18
(c) -11 (d) 4
11. Solve: $2(3x + 5) = 5x - 11$
- (a) $x = -21$ (b) $x = -16$
(c) $x = 2$ (d) $x = -1$
12. Solve: $\frac{1}{2}x + 6 = 3 + 2x$
- (a) $x = 3$ (b) $x = 2$
(c) $x = 0$ (d) $x = -3$
13. Solve: $\frac{7}{10}x - 1 = 2$
- (a) $x = \frac{30}{7}$ (b) $x = \frac{10}{7}$
(c) $x = \frac{7}{10}$ (d) $x = \frac{3}{7}$
14. Solve for x : $5w + 4x = 7k$
- (a) $x = \frac{7k + 5w}{4}$ (b) $x = 3kw$
(c) $x = \frac{7k - 5w}{4}$ (d) $x = 7k - 5w$

15. Solve for y : $3x + 4y = 12$

(a) $y = 12 - 3x$

(b) $y = \frac{3x-12}{4}$

(c) $y = 3 - 3x$

(d) $y = \frac{12-3x}{4}$

16. Solve for w : $P = 2l + 2w$

(a) $w = \frac{P-2l}{2}$

(b) $w = P - 2l$

(c) $w = P - l$

(d) $w = \frac{P-l}{2}$

17. Solve: $2(4x + 1) < 18$

(a) $x < 2$

(b) $x < \frac{17}{8}$

(c) $x > 2$

(d) $x > \frac{17}{8}$

18. Solve: $2x + 1 < 3x + 4$

(a) $x < 3$

(b) $x > 3$

(c) $x < -3$

(d) $x > -3$

19. If four times a number is increased by 7, the result is 15 less than the square of the number. Choose the equation that could be used to find this number, x .

(a) $4x + 7 = 15 - x^2$

(b) $4(x + 7) = x^2 - 15$

(c) $4x + 7 = x^2 - 15$

(d) $11x = x^2 - 15$

20. The sum of a number and 6 is 8 more than twice the number. Find the equation that could be used to find this number, x .

(a) $x + 6 = 2x + 8$

(b) $x + 6 = x^2 + 8$

(c) $x + 6 = 2(x + 8)$

(d) $6x = 2x + 8$

21. If a television costs \$180 after a 20% discount, what was the original cost?

(a) \$150

(b) \$200

(c) \$216

(d) \$225

22. The length of a rectangle is 2 feet more than width. The perimeter of the rectangle is 20 feet. Find the length.
- (a) 4 feet (b) 6 feet
(c) 9 feet (d) 11 feet
23. Identify the proportion that solves this problem. A car can travel 189 miles on 9 gallons of gasoline. How far can the car travel on 13 gallons?
- (a) $\frac{9}{189} = \frac{x}{13}$ (b) $\frac{189}{9} = \frac{x}{13}$
(c) $\frac{189}{13} = \frac{x}{9}$ (d) $\frac{189}{x} = \frac{13}{9}$
24. Identify the proportion that solves this problem. If you burn 722 calories in 3 hours while riding a bike, how many calories will you burn in 7 hours?
- (a) $\frac{3}{722} = \frac{x}{7}$ (b) $\frac{722}{3} = \frac{x}{7}$
(c) $\frac{722}{3} = \frac{7}{x}$ (d) $\frac{722}{3} = \frac{7}{3}$
25. Simplify: $(a^2b^3)^2$
- (a) a^4b^9 (b) a^2b^9
(c) a^4b^6 (d) a^4b^5
26. Simplify: $\frac{5x^2y}{x^3}$
- (a) $5x^5y$ (b) $\frac{5y}{x}$
(c) $5xy$ (d) $\frac{5x}{y}$

27. Simplify: $(x^2y^{-1})^{-3}$

(a) $\frac{y^3}{x^5}$

(b) $\frac{y^3}{x^6}$

(c) $\frac{1}{xy^4}$

(d) $\frac{y^4}{x^5}$

28. Simplify: $\frac{x^{-3}y^6}{x^{-4}y^4}$

(a) xy^2

(b) $\frac{y^2}{x}$

(c) $\frac{y^2}{x^7}$

(d) x^7y^2

29. Simplify: $x^{-2}x^{-6}$

(a) x^{12}

(b) $\frac{1}{x^8}$

(c) $\frac{1}{x^4}$

(d) $\frac{1}{x^{12}}$

30. Simplify: $(a^2b^0c^{-1})^3$

(a) $a^5b^3c^2$

(b) $\frac{a^6b^3}{c^3}$

(c) $\frac{a^5}{c^3}$

(d) $\frac{a^6}{c^3}$

31. Simplify: $\frac{a^{-2}b^{-1}c^2}{a^3b^0c^1}$

(a) $\frac{c}{a^5b}$

(b) $\frac{c}{a^5}$

(c) $\frac{a^5c}{b}$

(d) $\frac{bc}{a^5}$

32. Convert to standard form: 2.61×10^3
- (a) 0.00261 (b) 26.1
(c) 2,610 (d) 26,100
33. Convert to standard form. 7.96×10^{-2}
- (a) 0.00796 (b) 0.0796
(c) 796 (d) 7,960
34. Convert to Scientific Notation: 650,000
- (a) 65×10^4 (b) 6.5×10^5
(c) 6.5×10^{-5} (d) 0.65×10^6
35. Simplify: $(3x^2 - 4x + 8) + (2x^2 + 5x - 12)$
- (a) $5x^2 + x - 4$ (b) $5x^4 - x^2 - 4$
(c) $6x^4 + x^2 + 4$ (d) $6x^2 - 20x + 96$
36. Simplify: $(3x^2 + 2x - 6) - (x^2 - x + 2)$
- (a) $2x^4 + 3x^2 - 8$ (b) $2x^2 + x - 4$
(c) $2x^2 + 3x - 4$ (d) $2x^2 + 3x - 8$
37. Simplify: $(x^2 + 2x - 5) - (4x^2 - 3x - 1)$
- (a) $-3x^4 + 5x^2 - 4$ (b) $-3x^2 + 5x - 4$
(c) $-3x^2 + 5x - 6$ (d) $-3x^2 - x - 6$
38. Simplify: $3x(2x + 5)$
- (a) $6x^2 + 5$ (b) $5x^2 + 15x$
(c) $6x^2 + 15$ (d) $6x^2 + 15x$

39. Simplify: $4x^3(2x^2 - 7)$

(a) $8x^5 - 28x^3$

(b) $8x^6 - 7$

(c) $6x^5 - 28x^3$

(d) $8x^6 - 28x^3$

40. Simplify: $2xy(9x - 8y)$

(a) $18x^2 - 16y^2$

(b) $2x^2y^2$

(c) $18x^2y - 8y$

(d) $18x^2y - 16xy^2$

41. Simplify: $(2x + 5)(x + 9)$

(a) $3x^2 + 23x + 14$

(b) $3x^2 + 23x + 45$

(c) $2x^2 + 14x + 45$

(d) $2x^2 + 23x + 45$

42. Simplify: $(2x - 7)(2x + 7)$

(a) $4x^2 - 49$

(b) $2x^2 - 49$

(c) $4x^2 + 49$

(d) $4x^2 + 28x - 49$

43. Simplify: $(5x - 9)(x + 6)$

(a) $5x^2 + 39x - 54$

(b) $5x^2 + 21x - 3$

(c) $5x^2 - 3x - 15$

(d) $5x^2 + 21x - 54$

44. Simplify: $(2 - 3x)^2$

(a) $4 - 9x^2$

(b) $4 - 12x + 9x^2$

(c) $4 + 9x^2$

(d) $4 - 6x + 9x^2$

45. Factor completely: $4x^4 - 8x^3 - 4x^2 + 16x$

(a) $4x(x^3 - 2x^2 - x + 4)$

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

(c) $4x(x^3 - 2x^2 + x - 4)$

(d) $4(x^4 - 2x^3 - x^2 + 4x)$

46. Factor completely: $12a^2b^2 - 3ab$
- (a) $3ab(4ab)$ (b) $3ab(4ab - 1)$
(c) $3ab(4a^2b^2 - ab)$ (d) $ab(12ab - 3)$
47. Factor completely: $4x^2 - 9$
- (a) $(2x^2 + 3)(2x^2 - 3)$ (b) $(2x + 3)(2x - 3)$
(c) $(2x + 1)(2x - 9)$ (d) $(2x - 3)(2x - 3)$
48. Factor completely: $x^2 - 16y^2$
- (a) $(x + 8y)(x - 8y)$ (b) $(x + 4y)(x - 4y)$
(c) $(x - 8y)(x + 2y)$ (d) $(x - 4y)(x - 4y)$
49. Factor completely: $x^2 - 4x + 2xy - 8y$
- (a) $(x + 4)(x + 2y)$ (b) $(x + 4)(x - 2y)$
(c) $(x - 4)(x + 2y)$ (d) $(x - 4)(x - 2y)$
50. Factor completely: $ax - a + bx - b$
- (a) $(x + 1)(a + b)$ (b) $(x + 1)(a - b)$
(c) $(x - 1)(a + b)$ (d) $(x - 1)(a - b)$
51. Identify a factor of the following trinomial: $x^2 - 9x + 20$
- (a) $(x + 5)$ (b) $(x + 4)$
(c) $(x - 5)$ (d) $(x - 10)$
52. Identify a factor of the following trinomial: $5x^2 - 9x - 2$
- (a) $(5x + 2)$ (b) $(5x + 1)$
(c) $(x + 2)$ (d) $(x + 1)$

53. Simplify: $\frac{x-2}{x^2-4}$

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

(b) $\frac{1}{x+2}$

(c) $x-2$

(d) $x+2$

54. Simplify: $\frac{x^2-4x+3}{1-x}$

(a) $-x+3$

(b) $-x+1$

(c) $x-3$

(d) $x+3$

55. Simplify: $\frac{2x^2+x-15}{4x^2-16x+15}$

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

(b) $\frac{x+3}{2x+3}$

(c) $\frac{x-3}{2x-3}$

(d) $\frac{2x+1}{4(x-4)}$

56. Solve: $x^2 - 5x + 6 = 0$

(a) $x = 2, x = 3$

(b) $x = -2, x = -3$

(c) $x = 1, x = 6$

(d) $x = -1, x = 6$

57. Solve: $3x^2 + 14x + 8 = 0$

(a) $x = -\frac{2}{3}, x = -4$

(b) $x = \frac{2}{3}, x = 4$

(c) $x = -\frac{3}{2}, x = -4$

(c) $x = -\frac{4}{3}, x = -2$

58. Assuming the variable represents a non-negative number, simplify completely: $\sqrt{18x^3}$

(a) $3x\sqrt{2x}$

(b) $6x\sqrt{3x^2}$

(c) $9x\sqrt{2x}$

(d) $3\sqrt{6x^3}$

59. Assuming the variable represents a non-negative number, simplify completely: $\sqrt{25x^7}$

(a) $5x^6\sqrt{x}$

(b) $5x\sqrt{x^6}$

(c) $5x^3\sqrt{x}$

(c) $5x^2\sqrt{5x^3}$

60. Simplify: $\sqrt{50} + \sqrt{18}$

(a) 30

(b) $8\sqrt{2}$

(c) $1515\sqrt{2}$

(d) 16

61. Simplify: $\sqrt{3}(\sqrt{3} + \sqrt{6})$

(a) $6\sqrt{2}$

(b) 9

(c) $3 + 3\sqrt{2}$

(d) $\sqrt{6} + 3$

62. Find the x -intercept for $2x - 3y = 6$

(a) (0, 3)

(b) (0, -2)

(c) (3, 0)

(d) (-2, 0)

63. Find the y -intercept for $x + 3y = 7$

(a) $\left(0, \frac{7}{3}\right)$

(b) (0, 7)

(c) $\left(\frac{7}{3}, 0\right)$

(d) (7, 0)

64. Determine the graph which satisfies the given linear equation: $y = 2x - 3$.

65. Determine the graph of the following linear equation: $2x + y = -1$

ANSWER KEY

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|---------|---------|---------|
| 1. (b) | 23. (b) | 45. (a) |
| 2. (a) | 24. (b) | 46. (b) |
| 3. (c) | 25. (c) | 47. (b) |
| 4. (b) | 26. (b) | 48. (b) |
| 5. (b) | 27. (b) | 49. (c) |
| 6. (c) | 28. (a) | 50. (c) |
| 7. (c) | 29. (b) | 51. (c) |
| 8. (d) | 30. (d) | 52. (b) |
| 9. (b) | 31. (a) | 53. (b) |
| 10. (c) | 32. (c) | 54. (a) |
| 11. (a) | 33. (b) | 55. (a) |
| 12. (b) | 34. (b) | 56. (a) |
| 13. (a) | 35. (a) | 57. (a) |
| 14. (c) | 36. (d) | 58. (a) |
| 15. (d) | 37. (b) | 59. (c) |
| 16. (a) | 38. (d) | 60. (b) |
| 17. (a) | 39. (a) | 61. (c) |
| 18. (d) | 40. (d) | 62. (c) |
| 19. (c) | 41. (d) | 63. (a) |
| 20. (a) | 42. (a) | 64. (b) |
| 21. (d) | 43. (d) | 65. (d) |
| 22. (b) | 44. (b) | |