CUNY Elementary Algebra Final Exam

Sample A
August 2012

For the most up-to-date information on this exam, please visit http://www.cuny.edu/testing
1. Simplify.

\[ 7\sqrt{24} - 3\sqrt{6} \]

A) \(42\sqrt{2} - 3\sqrt{6}\)
B) \(25\sqrt{6}\)
C) \(11\sqrt{6}\)
D) \(12\sqrt{2}\)

2. Simplify completely.

\[ \sqrt{5}(\sqrt{15} + \sqrt{5}) \]

A) \(5\sqrt{3} + \sqrt{5}\)
B) \(25\sqrt{3}\)
C) \(3\sqrt{5} + 5\)
D) \(5\sqrt{3} + 5\)

3. Multiply. Give the answer in scientific notation.

\[ (3 \times 10^6)(4 \times 10^{-2}) \]

A) \(12 \times 10^4\)
B) \(1.2 \times 10^4\)
C) \(1.2 \times 10^5\)
D) \(1.2 \times 10^3\)

4. Simplify.

\[ \frac{x^5x^7}{(x^3)^2} \]

A) \(x^2\)
B) \(x^6\)
C) \(x^7\)
D) \(x^{29}\)
5. Simplify completely.
\[(5x^2 - 7x + 9) - (-2x^2 - 3x + 2)\]
A) \(3x^2 - 4x + 7\)
B) \(7x^2 - 4x + 7\)
C) \(7x^2 - 10x + 7\)
D) \(7x^2 - 4x + 11\)

\[(2x - 5)(x^2 + 4x - 6)\]
A) \(2x^3 + 3x^2 - 32x + 30\)
B) \(2x^3 + 8x^2 - 12x + 30\)
C) \(2x^3 + 3x^2 - 12x + 30\)
D) \(2x^3 + 8x^2 - 32x + 30\)

7. Simplify completely.
\[
\frac{25x^3 - 35x^2 + 5x}{-5x}
\]
A) \(-5x^2 + 7x\)
B) \(25x^3 - 35x^2\)
C) \(5x^2 - 7x + 1\)
D) \(-5x^2 + 7x - 1\)

8. Factor completely.
\[36x^2y - 100y^3\]
A) \(4(9x^2y - 25y^3)\)
B) \(4y(9x^2 - 25y^2)\)
C) \(4y(3x - 5y)(3x + 5y)\)
D) \(4y(3x - 5y)^2\)

9. Which of the following is a factor of the polynomial?
\[2x^2 - x - 55\]
A) \(x + 11\)
B) \(x - 5\)
C) \(2x + 11\)
D) \(2x - 11\)
10. Which of the following is a factor of the polynomial?

   \[21ab - 14ax + 15by - 10xy\]

   A) \(3b - 2x\)
   B) \(3b + 2x\)
   C) \(7a - 5y\)
   D) \(7a + 2y\)

11. If \(n\) represents a number, which equation is a correct translation of the sentence?

   **15 is 12 less than 2 times a number.**

   A) \(15 = 12 - 2n\)
   B) \(15 = 2(n - 12)\)
   C) \(15 = 2n - 12\)
   D) \(15 = 2(12 - n)\)

12. Solve for \(n\).

   \[5(8 - n) = 3n - 16\]

   A) \(n = 3\)
   B) \(n = -3\)
   C) \(n = -7\)
   D) \(n = 7\)

13. What is the value of the y-coordinate of the solution to the system of equations?

   \[\begin{align*}
   x + 3y &= 2 \\
   -3x - 8y &= 4
   \end{align*}\]

   A) \(y = -2\)
   B) \(y = 10\)
   C) \(y = 6\)
   D) \(y = -10\)
14. Solve for \( x \).

\[ z = 5x + y \]

A) \( x = \frac{z+y}{5} \)

B) \( x = \frac{z-y}{5} \)

C) \( x = \frac{z}{5} - y \)

D) \( x = 5(z-y) \)

15. Find all solutions to the equation.

\[ 4b^2 + 8b = 0 \]

A) Only \( b = -2 \)

B) Only \( b = 2 \)

C) \( b = 0 \) or \( b = 2 \)

D) \( b = 0 \) or \( b = -2 \)

16. Find all solutions to the equation.

\[ 10x^2 = 490 \]

A) \( x = 7 \) or \( x = 49 \)

B) \( x = 0 \) or \( x = 49 \)

C) \( x = 7 \) or \( x = -7 \)

D) Only \( x = 7 \)
17. What is the value of $x$ in the right triangle?

![Right Triangle Diagram]

A) $6\sqrt{2}$  
B) $2\sqrt{3}$  
C) 6  
D) $3\sqrt{10}$

18. Find the graph of the solution to the inequality.

$3x + 5 < 6x - 1$

A)  
B)  
C)  
D)  

19. Evaluate $g(2)$ for the function $g(x)$.

$g(x) = 3x^2 + 5x - 2$

A) 44  
B) 24  
C) 20  
D) 48
20. Which of the following is the graph of the equation?

\[-3x + 4y = 12\]

\[\text{Graphs A), B), C), D)}\]

21. Find the equation of the line passing through the points \((-2, 3)\) and \((1, -3)\). Write the equation in slope-intercept form.

A) \(y = -2x + 3\)
B) \(y = 2x + 7\)
C) \(y = -6x - 9\)
D) \(y = -2x - 1\)
22. Find the equation of the vertical line passing through the point \((-5, -2)\).
   A) \(y = x - 2\)
   B) \(y = -2\)
   C) \(x = -5\)
   D) \(y = \frac{2}{5}x - 2\)

23. Find the slope and \(y\)-intercept for the graph of the equation.
    \[3x + 4y = 8\]
   A) Slope = \(-\frac{3}{4}\) and \(y\)-intercept = \((0, 2)\)
   B) Slope = \(\frac{4}{3}\) and \(y\)-intercept = \((0, 8)\)
   C) Slope = \(\frac{3}{4}\) and \(y\)-intercept = \((0, 2)\)
   D) Slope = \(-\frac{4}{3}\) and \(y\)-intercept = \((0, 8)\)

24. If 6 gallons of gas cost $24, how much does 10 gallons of gas cost?
   A) $60
   B) $30
   C) $96
   D) $40

25. During the course of a year, the price of a house increased from $200,000 to $250,000. What was the percent increase in price?
   A) 5%
   B) 20%
   C) 25%
   D) 50%
## Answer Key

### CUNY Elementary Algebra Final Exam

#### Sample A

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