CUNY Elementary Algebra Final Exam

Sample D
June 2016

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. 
   \[ \sqrt{3} (\sqrt{3} + \sqrt{5}) \]
   A) \(3 + \sqrt{5}\)  
   B) \(9 + \sqrt{15}\)  
   C) \(\sqrt{3} + \sqrt{15}\)  
   D) \(3 + \sqrt{15}\)  

   \[ \frac{\sqrt{10}\sqrt{50}}{\sqrt{5}} \]
   A) \(5\sqrt{10}\)  
   B) \(\sqrt{10}\)  
   C) 10  
   D) 1  

4. Simplify. 
   \[ \frac{24x^6y^3}{-6x^3y} \]
   A) \(-4x^2y^3\)  
   B) \(-4x^3y^2\)  
   C) \(-4x^3y^3\)  
   D) \(-4x^9y^4\)
5. Simplify. 
\[(6x^3y^6)^2\]
A) \(6x^6y^{12}\)
B) \(12x^6y^{12}\)
C) \(36x^5y^8\)
D) \(36x^6y^{12}\)

\[(5x^2 - 7x + 9) - (-2x^2 - 3x + 2)\]
A) \(3x^2 - 4x + 7\)
B) \(7x^2 - 4x + 7\)
C) \(7x^2 - 10x + 7\)
D) \(7x^2 - 4x + 11\)

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

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

\[36x^2y - 100y^3\]
A) \(4(9x^2y - 25y^3)\)
B) \(4y(3x - 5y)(3x + 5y)\)
C) \(4y(3x - 5y)(3x - 5y)\)
D) \(4y(9x - 25y)(9x + 25y)\)
10. Which of the following is a factor of the polynomial?
   \[2x^2 - x - 55\]
   A) \(x + 11\)  
   B) \(x - 5\)  
   C) \(2x + 11\)  
   D) \(2x - 11\)

11. Which of the following is a factor of the polynomial?
    \[21ab - 14ax + 15by - 10xy\]
    A) \(3b - 2x\)  
    B) \(3b + 2x\)  
    C) \(7a - 5y\)  
    D) \(7a + 2y\)

12. 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) \(15 = 2(12 - n)\)

13. Solve for \(x\).
    \[
    \frac{x - 2}{3} + \frac{1}{6} = \frac{5}{6}
    \]
    A) \(x = 4\)  
    B) \(x = 6\)  
    C) \(x = 8\)  
    D) \(x = 3\)

14. Solve for \(n\).
    \[5(8 - n) = 3n - 16\]
    A) \(n = 3\)  
    B) \(n = -3\)  
    C) \(n = -7\)  
    D) \(n = 7\)
15. 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) \( y = -6 \)  \\
B) \( y = 10 \)  \\
C) \( y = 6 \)  \\
D) \( y = -10 \)

16. 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) \( x = 5(z - y) \)

17. 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 \( b = -2 \)

18. What is the value of \( x \) in the right triangle?

A) \( 6\sqrt{2} \)  \\
B) 6  \\
C) \( \sqrt{6} \)  \\
D) \( 3\sqrt{10} \)
19. Find the graph of the solution to the inequality.
\[ 3x + 5 < 6x - 1 \]

A)  
B)  
C)  
D)  

20. Given \( x = 2 \) and \( y = -3 \), evaluate the expression given below.

\[ 2x^2 - 3xy - 2y^2 \]

A) \(-28\)  
B) \(28\)  
C) \(8\)  
D) \(44\)

21. Which of the following is the graph of the equation?

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

A)  
B)  
C)  
D)  

[6]
22. 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) \(y = 2x - 5\)
   D) \(y = -2x - 1\)

23. Find the equation of the vertical line passing through the point \((-5, -2)\).
   A) \(y = x - 2\)
   B) \(y = -2\)
   C) \(x = -5\)
   D) \(y = \frac{2}{5}x - 2\)

24. 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 = \((0, 8)\)

25. What is the slope of the line graphed below?

   A) \(-\frac{5}{3}\)
   B) \(-\frac{3}{5}\)
   C) \(\frac{3}{5}\)
   D) \(\frac{5}{3}\)
## Answer Key

**CUNY Elementary Algebra Final Exam**

**Sample D**

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