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}

3. Simplify.  \( \frac{\sqrt{10}\sqrt{50}}{\sqrt{5}} \)

   A) 5\sqrt{10}  
   B) \sqrt{10}  
   C) 10  
   D) 1

4. Simplify.  \( \frac{24x^6y^3}{-6x^3y} \)

   A) \(-4x^2y^3\)  
   B) \(-4x^2y^2\)  
   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) \(4y(9x - 25y)(9x + 25y)\)

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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?

\[
\begin{align*}
9 \\ x \\ 3
\end{align*}
\]

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) \[
\begin{array}{|c|c|c|c|c|c|}
\hline
-5 & -4 & -3 & -2 & -1 & 0 \\
\hline
\hline
-6 & -5 & -4 & -3 & -2 & -1 \\
\hline
\end{array}
\]

B) \[
\begin{array}{|c|c|c|c|c|c|}
\hline
-5 & -4 & -3 & -2 & -1 & 0 \\
\hline
\hline
-6 & -5 & -4 & -3 & -2 & -1 \\
\hline
\end{array}
\]

C) \[
\begin{array}{|c|c|c|c|c|c|}
\hline
-5 & -4 & -3 & -2 & -1 & 0 \\
\hline
\hline
-6 & -5 & -4 & -3 & -2 & -1 \\
\hline
\end{array}
\]

D) \[
\begin{array}{|c|c|c|c|c|c|}
\hline
-5 & -4 & -3 & -2 & -1 & 0 \\
\hline
\hline
-6 & -5 & -4 & -3 & -2 & -1 \\
\hline
\end{array}
\]

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) \(\frac{5}{3}\)
You are allowed to use a scientific calculator on this exam.

Answer Key

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Sample D

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