Putnam County Algebra Exit Exam (Sample)

Select the **best** answer for each question.

1. Simplify
   \[ -8 - |6| \cdot 3 \cdot (-4) \]
   - A. 65
   - B. 64
   - C. 70
   - D. 62

Simplify. Your answer should contain only positive exponents.

2. \( n^{-4} \cdot 2n^3 \cdot 4n^2 \)
   - A. \( 3n^9 \)
   - B. \( n \)
   - C. \( 8n \)
   - D. 4

3. \( r^3 \cdot r^2 \)
   - A. \( 4r^3 \)
   - B. \( r^5 \)
   - C. \( 6r^8 \)
   - D. \( 16r^5 \)

4. \( 4x \cdot 2x^{-2} \)
   - A. \( \frac{8}{x} \)
   - B. \( 6x^8 \)
   - C. \( \frac{12}{x} \)
   - D. \( 16x^3 \)

5. Which statement is FALSE?
   - A. An algebraic expression contains at least one variable and at least one mathematical operation.
   - B. A numerical expression contains only numbers and mathematical operations.
   - C. A variable stands for a known number: its value is always the same.
   - D. An equation is a sentence that contains an equal sign.
6. Choose the correct expression for “the sum of two and the quotient of \( r \) and \( s \).

A. \( 2 + \frac{r}{s} \)  
B. \( \frac{r+2}{s} \)  
C. \( \frac{r}{2+s} \)  
D. \( \frac{2}{r+s} \)

7. Simplify \((a-4b)(a+4b)\)

A. \( a^2 - 8ab + 16b^2 \)  
B. \( a^2 - 16b^2 \)  
C. \( a^2 + 16b^2 \)  
D. \( a^2 + 8ab - 16b^2 \)

8. Factor completely. \(3x^2 - 12x^3\)

A. \(3(x^2 - 4x^3)\)  
B. \(3x^2(1 - 4x)\)  
C. \(3x^2(-4x)\)  
D. \(3(x - 4)\)

9. Simplify the expression. \(\frac{3a-4b}{6b} + \frac{a-2b}{6b}\)

A. \(\frac{2a-3b}{3b}\)  
B. \(\frac{2a+b}{2b}\)  
C. \(\frac{-7ab+a+6b}{3b}\)  
D. \(\frac{a-2b}{6b}\)

10. Simplify

\((3x^2 + 9x + 2) - (-3 + 7x^2)\)

A. \(10x^2 + 9x\)  
B. \(-4x^2 + 9x + 5\)  
C. \(10x^2 - 1\)  
D. \(10x^2 + 9x + 5\)
11. Simplify

\[ \sqrt{45} \]

A. \(5\sqrt{5}\)  
B. \(3\sqrt{5}\)  
C. \(4\sqrt{2}\)  
D. \(9\sqrt{5}\)

12. Simplify

\[ \sqrt{50} \]

A. \(2\sqrt{3}\)  
B. \(2\sqrt{5}\)  
C. \(3\sqrt{5}\)  
D. \(5\sqrt{2}\)

13. Give the degree of the polynomial.

\[ 5x^2y^3 - 2x^3y^3 + 7x^2 - 7y^3 \]

A. 2  
B. 5  
C. 6  
D. 3

14. Which relation is NOT a function?
15. Give the equation of the line passing through (1, 5) with a slope of -2.

A. \( y + 5 = -2(x - 1) \)

B. \( y - 5 = -2(x + 1) \)

C. \( y - 2 = -2(x - 5) \)

D. \( y - 5 = -2(x - 1) \)
16. Given the line \( y = 2x + 4 \) state the slope of a line that is perpendicular to the given line.

A. \( m = -2 \)

B. \( m = -\frac{1}{2} \)

C. \( m = \frac{1}{2} \)

D. \( m = 2 \)

17. Given the line \( 2x - 3y = 9 \) and the point \((4, -1)\), find a line through the point that is parallel to the given line.

A. \( y = \frac{2}{3}x - \frac{11}{3} \)

B. \( y = \frac{2}{3}x + 5 \)

C. \( y = -\frac{2}{3}x + 5 \)

D. \( y = -\frac{2}{3}x - 5 \)

18. Solve this inequality: \( 2(3x - 2) < 4x + 8 \)

A. 

B. 

C. 

D. 

\[ \begin{array}{c}
\text{A.} \\
\text{B.} \\
\text{C.} \\
\text{D.}
\end{array} \]
19. Graph the inequality on a coordinate plane $y < x + 2$. 

A.  

B.  

C.  

D.  

20. James’ school is selling tickets to a spring musical. On the first day of ticket sales the school sold 8 senior citizen tickets and 4 student tickets for a total of $120. The school took in $59 on the second day by selling 1 senior citizen ticket and 6 student tickets. What is the price each of one senior citizen ticket and one student ticket. 


B. senior citizen ticket: $8, student ticket: $11. 

C. senior citizen ticket: $11, student ticket: $8. 

D. senior citizen ticket: $14, student ticket: $12.
21. Using the formula to find the length of the hypotenuse of a right triangle, solve the equation for \( a \) (a and b are the lengths of the legs and c is the length of the hypotenuse.)

\[ a^2 + b^2 = c^2 \]

A. \( a^2 + b^2 = c^2 \)  
B. \( a = \sqrt{b^2 - c^2} \)  
C. \( a = \sqrt{c^2 - b^2} \)  
D. \( a = c^2 - b \)

22. Solve

\[ 3x + 2 = 8 \]

A. \( x = 3 \)  
B. \( x = \frac{10}{3} \)  
C. \( x = 2 \)  
D. \( x = -2 \)

23. Solve

\[ -20.853 = -18.97 + \frac{x}{19.7} \]

A. \( x = 26.9 \)  
B. \( x = -31 \)  
C. \( x = -28 \)  
D. \( x = -37.0951 \)

24. Solve

\[ 16.3m - 19.8 > -189.32 \]

A. \( m > -57 \)  
B. \( m > -10.4 \)  
C. \( m > -26.1 \)  
D. \( m > 6.5 \)

25. Solve

\[ x^2 = 20 \]

A. \( x = \pm 4\sqrt{5} \)  
B. \( x = \pm 2\sqrt{5} \)  
C. \( x = -2\sqrt{5} \)  
D. no solution

26. Solve

\[ x^2 = 16 \]

A. \( x = 4 \)  
B. \( x = -4, x = 4 \)  
C. \( x = -4 \)  
D. no solution

27. Solve
\[-2x - 4 = 12\]

A. \(x = 8\)  
B. \(x = -8\)  
C. \(x = -4\)  
D. \(x = 4\)

28. Solve
\[x^2 + 5x + 4 = 0\]

A. \(x = 4, x = 5\)  
B. \(x = 1, x = 4\)  
C. \(x = -1, x = -4\)  
D. \(x = 1, x = -4\)

29. Solve
\[x^2 - 8x = 0\]

A. \(x = 0\)  
B. \(x = -8\)  
C. \(x = 0, x = -8\)  
D. \(x = 0, x = 8\)

30. Solve
\[
\begin{align*}
-3x + y &= 11 \\
-x - 3y &= 7
\end{align*}
\]

A. \((1, 4)\)  
B. \((-1, -4)\)  
C. \((4, 1)\)  
D. \((-4, -1)\)

31. Solve
\[
\begin{align*}
-3x - 5y &= 1 \\
-9x - 15y &= 3
\end{align*}
\]

A. \((-9, -15)\)  
B. No Solutions  
C. Infinite Solutions  
D. \((-15, -9)\)
32. Choose the graph of the given function.

\[ f(x) = -2x + 4 \]
33. Find the slope of the line that contains the points.

\[(4, -2) \text{ and } (-5, 7)\]

A. \( m = 1 \)
B. \( m = -\frac{1}{2} \)
C. \( m = -5 \)
D. \( m = -1 \)

34. Choose the solution to the system of inequalities.

\[
\begin{align*}
y & \geq \frac{5}{2} x + 2 \\
y & > \frac{1}{2} x - 2
\end{align*}
\]

A.  
B.  
C.  
D.  

35. Find the mean of the data set. If necessary, round to the nearest tenth.
13.3, 16.1, 11.9, 19.8, 16.5

A. 15.5  
B. 15  
C. 16.5  
D. 14.5

36. Does the given function have a maximum or a minimum?

\[ f(x) = -x^2 - 2x + 2 \]

A. Minimum  
B. Maximum

37. Write and solve an inequality. An airline requires carry-on luggage to weigh at most 50 pounds. Your suitcase currently weighs 15 pounds. How many pounds \( p \) are available for you to fill your suitcase with other items?

A. \( p + 15 \leq 50 ; p \leq 35 \)  
B. \( p + 15 \geq 50 ; p \geq 35 \)  
C. \( 50 - p \leq 15 ; p \leq 35 \)  
D. \( p - 15 \leq 50 ; p \geq 65 \)

38. Which equation describes the table?

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<th>Length (m)</th>
<th>Area (m²)</th>
</tr>
</thead>
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<tr>
<td>0</td>
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</tr>
<tr>
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<td>7</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
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<tr>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

A. \( A = L (8 - L) \)  
B. \( A = L (16 - L) \)  
C. \( A = L (4 - L) \)  
D. \( A = L (L - 8) \)
39. Choose the graph of the line with a negative slope.
40. Choose the graph of the line with zero slope.
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 21 | C |
| 2 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 22 | C |
| 3 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 23 | D |
| 4 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 24 | B |
| 5 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 25 | B |
| 6 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 26 | B |
| 7 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 27 | B |
| 8 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 28 | C |
| 9 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 29 | D |
|10 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 30 | D |
|11 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 31 | C |
|12 | D |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 32 | D |
|13 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 33 | D |
|14 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 34 | C |
|15 | D |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 35 | A |
|16 | B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 36 | B |
|17 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 37 | A |
|18 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 38 | A |
|19 | A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 39 | C |
|20 | C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 40 | B |