Study Buddy

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Mathematics
Multiple Choice: 1 Point each.
Identify the choice that best completes the statement or answers the question.

1. The length and width of a rectangle are 48 inches and 40 inches. To the nearest inch, what is the length of its diagonal?
   A) 27              C) 88
   B) 62              D) 90

2. The expression $\sqrt{28} - \sqrt{7}$ is equivalent to
   A) $\sqrt{7}$              C) $3\sqrt{7}$
   B) 2              D) 4

3. What is the area of this figure?
   A) 70 square m              C) 225 square m
   B) 120 square m              D) 78 square m

4. Which set of numbers represents the lengths of the sides of a right triangle?
   A) $\{7, 24, 25\}$              C) $\{10, 12, 14\}$
   B) $\{9, 16, 23\}$              D) $\{14, 16, 18\}$
A cylinder has a circular base with a radius of 3 units and a height of 7 units. What is the volume of the cylinder in cubic units?
A) $2\pi$  
B) $42\pi$  
C) $63\pi$  
D) $147\pi$

Which expression is equivalent to $7\sqrt{90}$?
A) $16\sqrt{10}$  
B) $21\sqrt{10}$  
C) $70\sqrt{9}$  
D) $630$

In the diagram below, $\angle G$ and $\angle H$ are complementary.

What is the measure of $\angle G$?
A) $20^\circ$  
B) $30^\circ$  
C) $40^\circ$  
D) $50^\circ$

The lengths of the sides of a right triangle can be
A) $9, 12, 15$  
B) $8, 10, 13$  
C) $5, 5, 10$  
D) $4.5, 6$

The sum of $\sqrt{27}$ and $\sqrt{108}$ is
A) $\sqrt{135}$  
B) $9\sqrt{3}$  
C) $3\sqrt{3}$  
D) $4\sqrt{27}$
10. In the diagram below, line  \( m \) and line  \( n \) are parallel, and line  \( p \) is a transversal.

What is the measure of  \( \angle x \)?

A) 35°  
B) 55°  
C) 125°  
D) 215°

11. What is  \( \sqrt{150} + \sqrt{24} \) expressed in simplest radical form?

A) 7 \( \sqrt{6} \)  
B) 7 \( \sqrt{12} \)  
C) \( \sqrt{87} \)  
D) \( \sqrt{174} \)

12. In the accompanying diagram, parallel lines  \( \overrightarrow{AB} \) and  \( \overrightarrow{CD} \) are intersected by transversal at points  \( G \) and  \( H \), respectively,  \( m\angle AGH = x + 15 \), and  \( m\angle GHD = 2x \).

Which equation can be used to find the value of  \( x \)?

A)  \( 2x = x + 15 \)  
B)  \( 2x + x + 15 = 180 \)  
C)  \( 2x + x + 15 = 90 \)  
D)  \( 2x(x + 15) = 0 \)
13. In the diagram below, line \( l \) and line \( m \) are parallel.

\[ (3x + 21)° \]
\[ (6x + 15)° \]

Which equation could be used to solve for \( x \)?

A) \( 6x + 3x = 15 + 21 \)  
B) \( 6x + 15 = 3x + 21 \)  
C) \( 6x + 15 + 3x + 21 = 90 \)  
D) \( 6x + 15 + 3x + 21 = 180 \)

14. A figure consists of a square and a semicircle, as shown in the diagram below.

\[ \text{B} \quad \text{C} \]
\[ \text{A} \quad \text{D} \]

If the length of a side of the square is 6, what is the area of the shaded region?

A) \( 36 - 3\pi \)  
B) \( 36 - 4.5\pi \)  
C) \( 36 - 6\pi \)  
D) \( 36 - 9\pi \)

15. A circular garden has a diameter of 12 feet. How many bags of topsoil must Linda buy to cover the garden if one bag covers an area of 3 square feet?

A) 13  
B) 38  
C) 40  
D) 151
16. Which value is equivalent to the product of $4\sqrt{2}$ and $2\sqrt{6}$?
   A) $16\sqrt{3}$  
   B) $6\sqrt{12}$  
   C) $6\sqrt{8}$  
   D) $24\sqrt{2}$

17. In the diagram below, lines $l$ and $k$ are parallel.

   What is the measure, in degrees, of $\angle ABC$?
   A) $35^\circ$  
   B) $50^\circ$  
   C) $60^\circ$  
   D) $85^\circ$

18. In the diagram below, line segment $l$ and line segment $m$ intersect at the center of the circle. What is the measure of $\angle x$?

   A) $120^\circ$  
   B) $133^\circ$  
   C) $137^\circ$  
   D) $143^\circ$
Short Answer: 3 Points each.
You must show all your work. Only algebraic solutions will receive credit.

[19] In the accompanying diagram, line $m$ is parallel to line $p$, line $t$ is a transversal, $m \angle a = 3x + 12$, and $m \angle b = 2x + 13$. Find the value of $x$. 

[Diagram of parallel lines and transversal.]
Theo determined that the correct length of the hypotenuse of the right triangle in the accompanying diagram is \( \sqrt{20} \). Fiona found the length of the hypotenuse to be \( 2\sqrt{5} \). Is Fiona’s answer also correct? Explain your answer.
An 18-foot ladder leans against the wall of a building. The base of the ladder is 9 feet from the building on level ground. How many feet up the wall, to the nearest tenth of a foot, is the top of the ladder?
Look at the diagram below.

What is the value of $z$?
A windlass is used to tow a boat to the dock. The rope is attached to the boat at a point 15 feet below the level of the windlass (see figure below). Find the distance \(x\) from the boat to the dock when 75 feet of rope have been let out. Express your answer as a radical in simplified form.
In the accompanying diagram of $\triangle BCD$, $\angle C = 70$, $\angle CDE = 130$, and side $\overline{BD}$ is extended to $A$ and to $E$. Find $\angle CBA$. 
ACC Unit 5 Test – Polynomial Operations

**Part I – Short Response.**

1.) \((4x^2 - 6x + 2) + (-9x^2 - 4x + 8)\) 

2.) Simplify: \((4n - 3)(2n + 1)\)

3.) Subtract \(y^2 + 4y - 5\) from \(4y^2 - 2y + 1\)

4.) Simplify: \((2k^3)^4\)

5.) Simplify: \(5(2a + 3) - 8a\)

6.) Multiply: \((3x + 2)(3x - 2)\)

7.) Multiply: \((-4a^3b^7)(-5ab^2)\)

8.) Simplify: \((-9h)^0\)
9.) Simplify: $8^{-2}$

10.) Simplify: $9 - (4n - 1) + 3n$

11.) Divide: $\frac{-18a^4b^2c^7}{9a^3bc^2}$

12.) Multiply: $3x^2(2x^2 + 4x - 6)$

13.) Simplify: $(n - 4)^2$

14.) Simplify: $2^3 \cdot 2^5$

15.) Divide: $\frac{12r^4 - 3r^3 + 6r^2}{3r}$

16.) Divide: $\frac{8m^4 + 16m^3 + 4m^2}{4m^2}$
17.) Find the product of \((2y + 3)\) and \((y - 5)\).
18.) Simplify: \(\left( \frac{3}{5} \right)^{-4}\)

19.) Simplify: \(\left(5^6\right)^2\)
20.) Simplify: \(2(3x + 5) - 4(x - 2)\)

21.) Factor: \(12\pi r^2 - 18\pi r\)
22.) Multiply: \((5n + 2)(3n^2 - n + 4)\)
Part II – Extended Response.

23.) The perimeter of a rectangle is $16x + 10$. If the length is $5x + 4$, what is the width in terms of $x$?

24.) Simplify: $(6x^2 + 5x - 6) ÷ (2x + 3)$

25.) Afua and Akua are finding the perimeter of the rectangle shown below.

Afua decides to add all the sides. Akua uses the formula $P = 2L + 2W$ to write the expression $2(3a^2 - a + 6) + 2(2a + 7)$. Show that both women are correct.
Part I. Answer the following, show all work for partial credit ($\frac{100}{4}$ points each) 

1. Diana is going camping with her family. Their campsite is $\frac{3}{4}$ mile away. They walk at a steady speed of $1 \frac{1}{8}$ miles per hour. How many minutes will take them to get to the campsite?

2. If $x$ varies directly as $y$ when $x_1 = 13$, $x_2 = 3$, and $y_1 = 7$, then what is the value of $y_2$?

3. Find the sum of $(4.75 \times 10^6)$ and $(9.1 \times 10^6)$.

4. Anthony’s pizzeria offers the special “buy 1 large cheese pizza for $12.50, get the 2nd for $\frac{1}{2}$ off.” Johan must pay 4% sales tax on all pizzas. What is the cost, including tax, for 2 large cheese pizzas?
Math Quiz

Part I. Answer the following, show all work for partial credit (\(\frac{60}{6}\) points each)  

Score

1. Noj is 5 years older than Jacob. The product of their ages is 84. How old is Noj?
   
   A) 6  
   B) 7  
   C) 12  
   D) 14

2. Which event is certain to happen?
   
   A) Everyone walking into a room will have red hair.  
   B) All babies born in June will be males.  
   C) The Yankees baseball team will win the World Series.  
   D) The Sun will rise in the east.

3. Which equation represents a line that is parallel to the line whose equation is \(y = -3x - 7\)?
   
   A) \(y = -3x + 4\)  
   B) \(y = -\frac{1}{3}x - 7\)  
   C) \(y = \frac{1}{3}x + 5\)  
   D) \(y = 3x - 2\)

4. Which value of \(x\) is in the solution set of \(-3x + 8 \geq 14\)?
   
   A) -3  
   B) -1  
   C) 0  
   D) 3

5. What is the slope of the line that passes through the points (4, -7) and (9, 1)?
   
   A) \(\frac{5}{8}\)  
   B) \(\frac{8}{5}\)  
   C) \(-\frac{6}{12}\)  
   D) \(-\frac{13}{6}\)

6. If \(m<1\) is 55\(^\circ\) in a parallelogram, what is the measure of its supplementary angle?
   
   A) 35\(^\circ\)  
   B) 45\(^\circ\)  
   C) 115\(^\circ\)  
   D) 125\(^\circ\)

7. Which best describes a triangle with side lengths of 5 inches, 8 inches, and 15 inches?
   
   A) Ambiguously defined  
   B) Nonexistent  
   C) Unique triangle

8. Which best describes a triangle with side angles of 61\(^\circ\), 33\(^\circ\), and 86\(^\circ\)?
   
   A) Ambiguously defined  
   B) Nonexistent  
   C) Unique triangle
Part II. Answer the following, show all work for partial credit ($\frac{40}{2}$ points each)

9. A figure consists of a square and a circle, as shown in the diagram below. If the length of a side of the square is 6, what is the area of the shaded region to the nearest tenth?

![Diagram of a square and a circle]

10. Solve for m: $\frac{m}{5} + \frac{3(m-1)}{2} = \frac{2(m-3)}{1}$
Answer the following – show work for partial credit. \( \frac{100}{3} \) pts

1) Find the slope and y-intercept of: \(-8x + 4y = -16\)

   Slope_______

   Y-intercept_______

2) Fill in the T-chart:

   \[ \begin{array}{c|c|c|c|c|c|c|c} X & Y = 3x + 7 & Y & (X,Y) \\ \hline 0 & & & \\ \hline 1 & & & \\ \hline -1 & & & \end{array} \]

3) Find the slope of the points \((0,-4)\) and \((1,1)\). ___