MDTP Elementary Algebra Diagnostic Sample Test

Calculators are not allowed for the test.

1. \( \sqrt{0.49} - \frac{7}{4} = \)
   (A) 6.75  (B) 5.25  (C) 1.05  (D) -1.05  (E) -1.68

2. \[
\begin{align*}
2x - y &= 6 \\
5x + 3y &= 15
\end{align*}
\]
then \( y = \)
   (A) -21  (B) -9  (C) 0  (D) 3  (E) 9

3. One of the factors of \( x^2 - 2x - 24 \) is
   (A) \( x - 6 \)  (B) \( x - 2 \)  (C) \( x + 8 \)  (D) \( x + 3 \)  (E) \( x - 24 \)

4. \( \frac{3}{10} - \frac{5}{6} = \)
   (A) -32  (B) \(-\frac{2}{4}\)  (C) \(-\frac{1}{2}\)  (D) \(-\frac{32}{60}\)  (E) \(-\frac{8}{15}\)

5. \( \sqrt{3} \cdot \sqrt{6} - \sqrt{50} = \)
   (A) \(-\sqrt{32}\)  (B) \(-4\sqrt{2}\)  (C) \(-2\sqrt{2}\)  (D) \(2\sqrt{2}\)  (E) \(4\sqrt{2}\)

6. Which of the following graphs best represents all values of \( x \) such that \(-2x < 6 \) and \( x - 2 < 0 \) ?

   (A) ![Graph A]
   (B) ![Graph B]
   (C) ![Graph C]
   (D) ![Graph D]
   (E) ![Graph E]

7. \( (2y - 5x)^2 = \)
   (A) \( 4y^2 - 10xy + 25x^2 \)  (B) \( 4y^2 - 10xy - 25x^2 \)  (C) \( 4y^2 - 20xy + 25x^2 \)
   (D) \( 4y^2 + 25x^2 \)  (E) \( 4y^2 - 25x^2 \)
8. \( \frac{5^8}{5^4} = \)
(A) \( \frac{1}{5^4} \)  (B) \( \frac{1}{5^2} \)  (C) 2  (D) 5^4  (E) 5^2

9. If the sum of three consecutive odd integers is 39, what is the largest of these odd integers?
(A) 11  (B) 12  (C) 13  (D) 14  (E) 15

10. If \( x - \frac{3}{5}x = 12 \), then \( x = \)
(A) -20  (B) -\( \frac{36}{5} \)  (C) -6  (D) 6  (E) 30

11. \( \frac{x^2 - 5x}{x^2 - 25} = \)
(A) \( \frac{x}{x+5} \)  (B) \( \frac{x}{5} \)  (C) \( \frac{x}{x-5} \)  (D) \( \frac{5-x}{-25} \)  (E) \( \frac{x^2-1}{x-5} \)

12. In the right triangle ABC shown to the right, what is the length of AC?
(A) 3  (B) 4  (C) 7  (D) \( \sqrt{106} \)  (E) 2\( \sqrt{14} \)

13. One of the solutions of the equation \( x^2 - 2x = 15 \) is
(A) -15  (B) -1  (C) 3  (D) 5  (E) 15

14. If the length of a rectangle is 5 inches less than twice its width and the perimeter of the rectangle is 32 inches, what is the length, in inches, of the rectangle?
(A) 7  (B) 9  (C) \( \frac{37}{2} \)  (D) \( \frac{37}{3} \)  (E) 27

15. \( \frac{3}{w} + \frac{w}{w+1} = \)
(A) \( \frac{3}{w+1} \)  (B) \( \frac{3w}{2w+1} \)  (C) \( \frac{w^2+3w+3}{2w+1} \)  (D) \( \frac{w^2+3w+3}{w^2+w} \)  (E) \( \frac{w^2+6w}{w^2+w} \)
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**ARTH**  
Arithmetic Operations

**EXPS**  
Exponents and Square Roots

**GEOM**  
Geometric Measurement

**GRPH**  
Graphing

**LINR**  
Linear Equations and Inequalities

**POLY**  
Polynomials

**QUAD**  
Quadratic Equations

**RATL**  
Rational Expressions

**WORD**  
Word Problems