Practice Materials for the Math Placement Exam

*You should be able to do this practice exam without the use of a calculator. The exam format is similar to how questions are asked here and answers must be typed in the boxes provided. Only numbers and the negative sign "-" are acceptable in the answer boxes (no special formatting, no decimals, no letters). When checking your answers to this practice exam, your answer must match exactly to be correct. *These are NOT the exact problems from the exam.*

1. Compute $31 - (-11) - (6 - 9)$

2. Find the numerical value of $11 - 3(21 - 16)$

3. Evaluate $|-24 + 17|$

4. Compute $\left(\frac{3}{5}\right)^2$ in lowest terms.

5. Add the following fractions and express your answer as a fully reduced fraction: $\frac{2}{3} + \frac{5}{11}$

6. Divide the following fractions and express your answer as a fully reduced fraction: $\frac{13}{5} \div \frac{10}{3}$

7. Simplify: $\left(\frac{1}{2} \cdot \frac{-4}{5}\right) + \left(\frac{-1}{3} \cdot \frac{3}{4}\right)$

8. Simplify the expression $4(3x + 1) - (2x - 6)$ to one of the form $ax + b$.

$a =$

$b =$

9. Solve for x: $5x + 2 = -3x + 4$

10. Simplify the expression $(3x^2 + 2x - 3) - (4x^2 - 2x - 6)$ to one of the form $ax^2 + bx + c$. Write your answers for a, b, and c.

$a =$

$b =$

$c =$

11. Calculate the slope of the line going through the points $(-5, 6)$ and $(2, 3)$.

12. Solve for x: $2(x - 3) = 1 - 4(2x + 5)$

13. Evaluate $x^2 - 2x + 6$ for $x = -1$.

14. Solve for x: $x^2 - 11x = -28$. Enter your answers in any order.

$x =$ $x =$

15. Simplify $\frac{20x^3y^4}{2x^6y^3}$. Enter a, b, and c where the answer is ax^by^c.

$a =$

$b =$

$c =$

16. Find the two roots x_1 and x_2 of the quadratic equation $x^2 - 8x + 12 = 0$. Enter your answers in any order.

$x =$ ☐ $x =$ ☐

17. Solve for x: $\frac{2}{x} - \frac{1}{4} = \frac{1}{7}$

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18. Solve for x: $|4x + 1| + 3 = 6$. Enter your answers in any order.

$x =$ ☐ $x =$ ☐

19. If $f(x) = -3x + 7$, calculate and simplify $\frac{f(4+h)-f(4)}{h}$. Enter the values of a and b, where your answer is in the form $ah + b$.

$a =$ ☐

$b =$ ☐

20. The graph of $y = \frac{1}{x+2} + 9$ is the graph of $y = \frac{1}{x}$ with what transformations?

(a) shifted left 9 units and down 2 units
(b) shifted left 2 units and up 9 units
(c) shifted left 2 units and down 9 units
(d) shifted right 2 units and up 9 units
(e) shifted left 9 units and up 2 units

21. A right triangle has sides A, B, and C, where C is the hypotenuse. Side A has length 18, side B has length 24, and side C has length 30. If θ is the angle between sides A and C, what is the value of $\sin(\theta)$? Enter your answer as a fully simplified fraction.

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22. Which of the following is the inverse of $f(x) = (x - 10)^3$?

(a) $f^{-1}(x) = (x - 10)^{\frac{1}{3}}$
(b) $f^{-1}(x) = (x - 10)^{\frac{1}{3}} + 10$
(c) $f^{-1}(x) = x^{\frac{1}{3}} - 10$
(d) $f^{-1}(x) = x^{\frac{1}{3}} + 10$
(e) $f^{-1}(x) = x^3 + 10$

23. Solve for x: $7^{x+6} = 2$. Enter a, b, and c where your answer is $x = \log_b a + c$.

$a =$ ☐

$b =$ ☐

$c =$ ☐

24. Evaluate $\ln(e^{43})$.

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25. Find the equation of the curve formed by vertically stretching the graph of $y = \sin(x)$ by 2 and then shifting it right by 7 units. Enter a, b, c, and d where your answer is $y = a\sin(bx + c) + d$.

$a =$ ☐

$b =$ ☐

$c =$ ☐

$d =$ ☐

26. Use the method of completing the square to write $x^2 + 6x - 2$ in the form $(x + a)^2 + b$.

$a =$ ☐

$b =$ ☐

Answers:

1. 45 2. $\frac{-4}{1}$ 3. 7 4. $\frac{9}{25}$ 5. $\frac{37}{33}$ 6. $\frac{39}{50}$ 7. $\frac{-13}{10}$ 8. a= 10, b= 10 9. $\frac{1}{4}$ 10. a= -1, b= 4, c= 3 11. $\frac{-3}{7}$ 12. $\frac{-13}{10}$ 13. 9 14. x= 4 x= 7 15. a= 10, b= -3, c= 1

16. x= 6 x= 2 17. $\frac{56}{11}$ 18. x= $\frac{-1}{1}$ x= $\frac{1}{2}$ 19. a= 0, b= -3 20. (b) 21. $\frac{4}{5}$ 22. (d) 23. a= 2, b= 7, c= 6 24. 43 25. a= 2, b= 1, c= -7, d= 0 26. a= 3, b= -11