

## ASU Mathematics Placement Test

1. Evaluate  $(11.5)(0.06)$
2. Evaluate  $(1.062) \div (0.08)$
3. Evaluate  $(2 - 2)^5$
4. Evaluate  $13 - 3[8 + (4 - 9)]$
5. Evaluate  $-17 + (-11)$
6. Evaluate  $23 - (-8)$
7. Evaluate  $3 - \frac{2}{5}$
8. Evaluate  $\left(2\frac{1}{2}\right)\left(-\frac{8}{3}\right)\left(-\frac{21}{16}\right)$
9. Evaluate  $\frac{3}{8} \div 15$
10. Evaluate  $2.31 - 1.009 + 1.5$
11. Evaluate  $(-2)^4$
12. Evaluate  $25 - [3^3 - 4^2]$
13. Evaluate the expression

$$x^2 - xy + 2y^2$$

when  $x = 1$  and  $y = -2$

14. Evaluate the expression

$$|x^3 - 1|$$

when  $x = -1$

15. Evaluate the expression

$$\frac{x - 3}{6 + 2x}$$

when  $x = 3$

16. Multiply and simplify  $(2 - 3v)^2$
17. Multiply and simplify

$$2x(x - 4) - (x + 2)(x - 1)$$

## Sample Problems

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18. Simplify

$$\left[\frac{(x+1)^2}{x^3} \cdot \frac{5x}{x^3+9x}\right] \div \frac{x+1}{x^2+9}$$

19. Add and simplify  $\frac{1}{2} + \frac{2}{x} + \frac{3}{x^2}$
20. Simplify  $(-2xyz)^3$
21. Simplify  $(a^2b)^2(ab^2)^3$
22. Rewrite  $3x^{-3}$  without negative exponents
23. Simplify  $(2xy^{-2})^{-3}$
24. Simplify  $\sqrt{175}$
25. Simplify  $\sqrt{12x^2}$
26. Simplify  $\frac{6x^2(x-2)^2}{x(x-2)^6}$
27. Multiply and simplify

$$\frac{x^2 + 2x - 3}{x + 2} \cdot \frac{x^2 + 2x}{x^2 - 1}$$

28. Divide and simplify

$$\frac{8x^3 + 27}{2x^2 + 3x} \div \frac{4x^2 - 6x + 9}{3x^3}$$

29. Simplify  $\frac{\left(\frac{2}{t^2 + t - 2}\right)}{\left(\frac{4}{t^2 - t - 6}\right)}$

30. Rationalize the denominator and simplify  $\frac{4}{\sqrt{28}}$

31. Rationalize the denominator and simplify  $\sqrt{\frac{18}{t}}$

32. Divide and simplify  $\frac{4y^2}{9x} \div \frac{16}{27xy^2}$

33. Simplify  $\sqrt{\frac{x}{9}} - \sqrt{\frac{x}{16}}$

34. Simplify  $\frac{-18x^2yz}{-21xy^2z}$

35. Divide  $\frac{3x^2 - 9x}{3x}$

36. Simplify  $\frac{2x^2 - 5x - 3}{x^2 - 9}$

37. Multiply and simplify

$$\frac{2}{u-3} \cdot \frac{3-u}{8}$$

38. Simplify  $4a + \frac{1}{2}b - 5a - \frac{3}{2}b$

39. Simplify  $2t - [3t - (5 - t + 4t^2)]$

40. Simplify  $5xy - x(x - y)$

41. Multiply and simplify

$$-3u(2 - u - u^2)$$

42. Simplify  $2x - 3[x - 2(x + 7)]$

43. Simplify  $\frac{x}{4} - \frac{x}{3}$

44. Simplify  $\frac{\sqrt{3}}{\sqrt{48}}$

45. Multiply and simplify

$$\sqrt{3}(4 - \sqrt{12})$$

46. Simplify  $\sqrt{\frac{9x^4}{y^3}}$

47. Multiply and simplify

$$(\sqrt{x} - 3)(\sqrt{x} + 1)$$

48. Add  $(7 - 4x - 3x^2) + (3y + 1)$

49. Subtract and simplify

$$\frac{4x}{x^2 - 4} - \frac{3}{x + 2}$$

50. Subtract  $(7 - 4x - 3x^2) - (3x + 1)$

51. Simplify  $\frac{\left(\frac{6}{x-1} - 3\right)}{\frac{3}{x}}$

52. Multiply and simplify

$$(x + 2)(x^2 - 2x + 4)$$

53. Multiply and simplify  $[2 - (x - y)]^2$

54. Rationalize the denominator and simplify

$$\frac{\sqrt{3}}{\sqrt{2} - 1}$$

55. Solve  $(2x - 5)(x + 3) = 0$

56. Solve  $\frac{3}{x} = \frac{1}{6}$

57. Solve the inequality  $4x - 1 \leq 15$

58. Solve for  $y$  when

$$y - 2[y + 2(2y - 1)] = 40$$

59. Solve the system of equations

$$\begin{cases} -x + 2y = 2 \\ 3x - y = 9 \end{cases}$$

60. Solve  $(2x + 1)(x - 2) = 18$

61. Solve the inequality  $3 > 3 - x > 1$

62. Solve

$$\frac{1}{x-2} + \frac{1}{x+3} = \frac{17}{x^2 + x - 6}$$

63. Solve  $4 - t = 3$

64. Solve  $\sqrt{x+3} = x - 3$

65. Solve  $3x^2 - 12x - 6 = 0$

66. Solve for  $l$  when  $P = 2w + 2l$

67. Solve  $9x^3 - 4x = 0$

68. Solve  $4 - (x - 1) = 2x + 1$

69. Solve  $2 + 0.5x = 5$

70. Solve the system of equations

$$\begin{cases} 3x + 4y = -5 \\ x - 2y = 15 \end{cases}$$

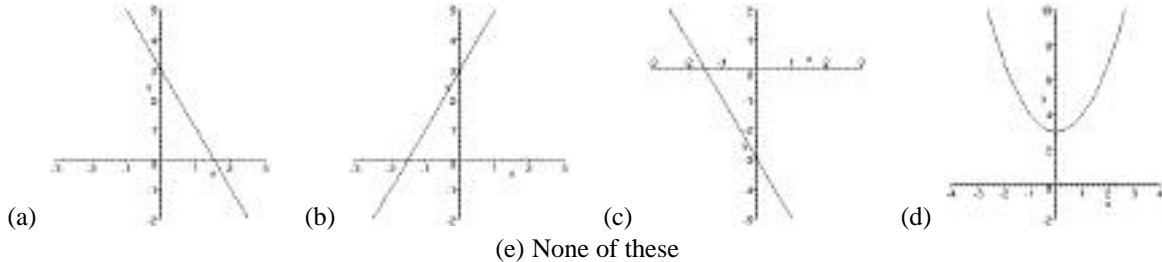
71. Solve for  $x$  when  $x^2 + 2x = 24$

72. Solve  $3x - 10 = 11$

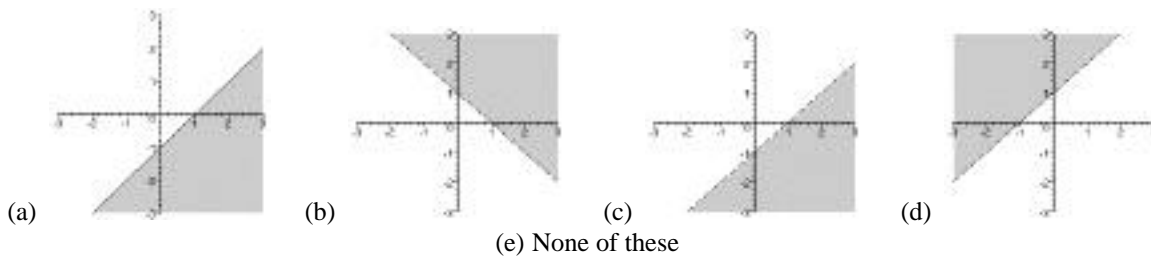
73. Solve  $\frac{2x+1}{5} - \frac{x+1}{3} = \frac{1}{15}$
74. Solve  $(x+3)^2 = 7$
75. Solve  $\sqrt{3x-2} = x$
76. Solve the system 
$$\begin{cases} 2x - 5y = -4 \\ 4x + 3y = 5 \end{cases}$$
77. Solve  $\sqrt{7-2x} = 2$
78. Solve  $12x^2 - 3x$
79. Solve  $\frac{1}{x} - 3 = 1$
80. Solve  $\frac{2}{x+1} = \frac{4}{5}$
81. Solve  $6x^2 - x = 15$
82. Solve the system of equations 
$$\begin{cases} -4x + 2y = 14 \\ 5x + 3y = -1 \end{cases}$$
83. Solve  $x^2 - 5x - 4 = 0$
84. Solve  $\frac{2}{\sqrt{x-1}} = 3$
85. Solve  $3x^2 = 12x$
86. Twelve is 24% of what number?
87. 290 is what percent of 250?
88. A candy store wishes to package a box of light and dark chocolates. The light chocolates cost \$4 per pound and the dark chocolates cost \$5 per pound. If one pound of light chocolates is used, how many pounds of dark chocolates are needed to produce a mixture worth \$4.75 per pound?
89. How much must be invested in an account that earns 6% simple interest in order to have \$10,000 in this account 1 year from now?
90. A shirt that lists for \$28 is advertised at 40% off. Find the selling price.
91. A total of \$10,000 is invested into two funds paying  $7\frac{1}{2}\%$  and 9% simple interest. The combined annual income for the two funds is \$849. Determine how much is invested at each rate.
92. A company has 110 employees. If the number of employees is increased by 30%, how many employees will the company have?
93. Find the total amount paid for a washing machine if the downpayment of \$175 is made plus 7 monthly payments of \$50 each.
94. Two people travel to separate cities in the same amount of time. The first person travels 210 miles at an average speed that is two miles per hour slower than the second person. The second person travels 217 miles. What is the average speed of the slower car?
95. Find a number such that 7 added to twice this number is 76.
96. The sum of three consecutive integers is 72. Find these integers.
97. A man's shirt, advertised for sale at 20% off the original price, is now selling for \$25. Find the original price of the shirt.
98. The length of a rectangle is three inches more than twice its width. The area of the rectangle is 27 square inches. Find the dimensions of the rectangle.
99. The product of two consecutive positive integers is 72. Find these numbers.
100. The sum of two numbers is 71. The second number is four less than four times the first number. Find the numbers.
101. Determine the slope of the line passing through the points  $(2, -3)$  and  $(-1, 5)$ .  
 (a) 2                      (b)  $-\frac{8}{3}$                       (c)  $-\frac{3}{8}$   
 (d) -5                      (e) None of these
102. Find the slope of the line given by the equation  $8x - 2y = 7$ .  
 (a) 4                      (b)  $\frac{1}{4}$                       (c)  $-\frac{7}{2}$   
 (d) 0                      (e) None of these

103. Using the slope, determine whether the graph of the line that is given by the equation  $x - y + 1 = 0$  rises, falls, is horizontal, or is vertical.  
 (a) Rises (b) Falls (c) Horizontal  
 (d) Vertical (e) None
104. Find an equation for the line passing through the points  $(2, -1)$  and  $(-6, 1)$ .  
 (a)  $4x + y = 7$  (b)  $y + 1 = 0$   
 (c)  $x + 4y + 2 = 0$  (d)  $x + 4y + 6 = 0$   
 (e) None
105. Determine the slope of a line *parallel* to the line given by  $3x - y + 8 = 0$ .  
 (a) 3 (b)  $\frac{8}{3}$  (c)  $-\frac{3}{8}$   
 (d)  $-\frac{1}{5}$  (e) None of these
106. Find the  $y$ -intercept of the graph of the equation  $-6x + 8y = 3$   
 (a)  $(-\frac{1}{2}, 0)$  (b)  $\frac{3}{8}$   
 (c)  $(0, \frac{3}{8})$  (d)  $(-6, 8)$   
 (e) None of these

107. Determine the graph of the equation  $2x - y = -3$



108. Sketch the half-plane determined by the inequality  $x - y > 1$



109. Find an equation for the horizontal line passing through the  $(3, -4)$ .  
 (a)  $y + 4 = 0$  (b)  $x - 3 = 0$   
 (c)  $y - 3 = 0$  (d)  $x + 3 = 0$   
 (e) None of these
110. Find an equation for the line passing through the point  $(4, -1)$  with the slope  $m = \frac{2}{3}$   
 (a)  $y = \frac{2}{3}x - 1$   
 (b)  $2x - 3y = 11$   
 (c)  $2x - 3y = -5$   
 (d)  $3x - 2y = -5$   
 (e) None of these
111. Find an equation for the line passing through the point  $(2, -6)$  and *perpendicular* to the line  $y - 4 = 0$   
 (a)  $2x - 6y = 0$   
 (b)  $x = 2$   
 (c)  $y + 6 = 0$   
 (d)  $y = 6$   
 (e) None of these
112. Evaluate  $6 + 3 \cdot 2 - 4 \div 4$   
 (a)  $\frac{7}{2}$  (b) 2 (c) 11  
 (d) 17 (e) None of these
113. Simplify  $(a^2b^{-2})^3(a^3b)$   
 (a)  $\frac{a^{18}}{b^5}$  (b)  $\frac{a^8}{b^4}$   
 (c)  $\frac{a^9}{-b^7}$  (d)  $\frac{a^9}{b^5}$   
 (e) None of these

114. Simplify  $\frac{3x}{5} - \frac{3x}{7}$   
 (a)  $\frac{6x}{35}$  (b) 0  
 (c)  $-\frac{6x}{35}$  (d)  $6x$   
 (e) None of these
115. Solve the inequality  $12 - 5x \geq 37$   
 (a)  $x \geq 5$  (b)  $x \leq -5$  (c)  $x < 5$   
 (d)  $x \leq -\frac{49}{5}$  (e) None of these
116. Multiply  $(x - 2)^2$   
 (a)  $x^2 - 4x - 4$  (b)  $x^2 + 4$   
 (c)  $x^2 - 4$  (d)  $x^2 - 4x + 4$   
 (e) None of these
117. Solve  $5x^2 = -2x$   
 (a)  $x = 0$  (b)  $x = 0, \frac{2}{5}$   
 (c)  $x = 0, -\frac{2}{5}$   
 (d) No real solutions  
 (e) None of these
118. Write without negative exponents  $3xy^{-2}$   
 (a)  $\frac{3x}{y^2}$  (b)  $-3xy^2$   
 (c)  $\frac{1}{3xy^2}$  (d)  $\frac{3}{xy^2}$   
 (e) None of these
119. Find the slope of the line going through  $(-3, 2)$  and  $(-4, 2)$   
 (a) 0 (b) undefined  
 (c)  $-\frac{4}{7}$  (d)  $-\frac{7}{4}$   
 (e) None of these
120. Simplify  $\frac{\sqrt{2}}{\sqrt{18}}$   
 (a)  $\frac{1}{9}$  (b)  $\frac{1}{3}$   
 (c)  $-\frac{1}{3}$  (d)  $-\frac{1}{3}, \frac{1}{3}$   
 (e) None of these
121. Solve  $\frac{1}{x} - \frac{1}{x+2} = 1$   
 (a)  $-1 \pm 2\sqrt{3}$  (b)  $-1 \pm \sqrt{12}$   
 (c)  $-1 \pm \sqrt{3}$  (d)  $\pm\sqrt{3}$   
 (e) None of these
122. Evaluate the expression  $a^2 - 2a + 5$  given that  $a = -3$   
 (a)  $-2$  (b) 20  
 (c) 5 (d) 19  
 (e) None of these
123. A man has 21 coins in dimes and nickles. His total is \$1.55. How many nickles does he have?  
 (a) 10 (b) 21  
 (c) 11 (d) Cannot be solved  
 (e) None of these
124. Solve  $x^2 + 2x = 4$   
 (a)  $\pm 2\sqrt{5}$  (b)  $-1 \pm 2\sqrt{5}$   
 (c) No real solution  
 (d)  $1 \pm \sqrt{5}$  (e) None of these
125. Simplify  $\frac{a^{1/2} \cdot a^{-5/2}}{a^{3/2}}$   
 (a)  $a^{3/2}$  (b)  $a^{-7/2}$   
 (c)  $\frac{1}{a^{7/2}}$  (d)  $a^{9/2}$   
 (e) None of these