Woodland Community College: Math Practice Test

Elementary Algebra Math Test

The following problems are recommended practice problems for the elementary algebra section of the placement test. Some of the problems may or may not be similar to the problems on the actual test. If you struggle to complete any problems, we suggest that you review those topics before taking the test.

Perform the indicated operations

1. $\left(120-6^2\right)\div\left(4\bullet 8\right)$
2. $\dfrac{2^3-3^2+12\bullet 5}{-32\div(-16)\div(-4)}$
3. $(-4)^2-\left(3^3-2(6)+(-4+2)\right)$
4. $\left|-8-2\right|+\left|-4\right|-\left|-16\right|$
5. $\left(-4x^2-5x+2\right)+(3x^2-6x+1)-(-x^2+2x+7)$
6. $5(x+3)-(3x-4)$
7. $10-3(2x+3)-7x$
8. $\left(3x^2y-6xy+x^2y^2-5\right)-\left(11x^2y^2-1+5yx^2\right)$
9. Subtract $8x^2+3x-2$ from $4x^2-3x-2$
10. Subtract $4x+3$ from the sum of $2x-7$ and $9x+5$

11. Evaluate the expression $3a^2-2b^2+4ab+1$ when $a=-2$ and $b=-3$.
12. Evaluate the expression $-x^2-y+7$ when $x=-5$ and $y=-2$.
13. Evaluate the expression $\dfrac{x^2-y^2}{(x-y)^2}$ when $x=3$ and $y=-2$
14. Solve each equation. (a) $2(4x-5)-4(4-2x)=-2$ (b) $\dfrac{4x-7}{5}=2-(4-y)$

    (c) $5(3x-2)-2x=6-2(3+x)$ (d) $\dfrac{8}{3}x-2=\dfrac{5}{3x}+4$ (e) $\dfrac{3}{4}(8x-12)=\dfrac{1}{2}(4x+4)$
15. Solve $5xy-3x=6$ for *y*.
16. Solve $4ab-7c=2$ for b.
17. Solve $5F-9C=160$ for F.
18. 38% of the students in a math class are male. There are 50 students in the class. How many students are male?
19. 75 is what percent of 50?
20. Three times a number minus 6 is equal to two times a number plus 8. Find the number.
21. A flower bed is in the shape of a triangle with one side twice the length of the shortest side and the third side is 30 feet more than the length of the shortest side. Find the dimensions if the perimeter is 102 feet.
22. Solve $-3x+2\le 7$

23. Solve $2 < 3x - 10 \leq 5$

24. Solve $-3 \leq \dfrac{-2x+2}{5} \leq 4$

25. Solve $-2x < -10 \quad and \quad x - 3 < 8$

26. Solve $x + 6 < 0 \quad or \quad 4x > -16$

27. Solve $3(x-4) < 2(2x-1)$

28. A shop advertised a 23% off sale. If a coat originally sold for $256. Find the decrease in price and the sale price.

29. Two angles are supplementary if their sum is $180°$. The larger angle measures three more than twice the measure of a smaller angle. Find the measures of each angle.

30. A 15 inch piece of steel is cut into three pieces so that the second piece is twice as long as the first piece and the third piece is one inch more than four times the length of the first piece. Find the length of the each piece.

31. Part of the proceeds from a garage sale amounted to $280 in $5 and $10 denominations. If there were 20 more $5 bills than $10 bills, find the number of each denomination.

32. How many cubic centimeters of 25% antibiotic solution should be added to 10 cubic centimeters of 60% antibiotic solution in order to get a 30% antibiotic solution?

33. Find last year's salary if after a 3% pay raise, this year's salary is $31,930.

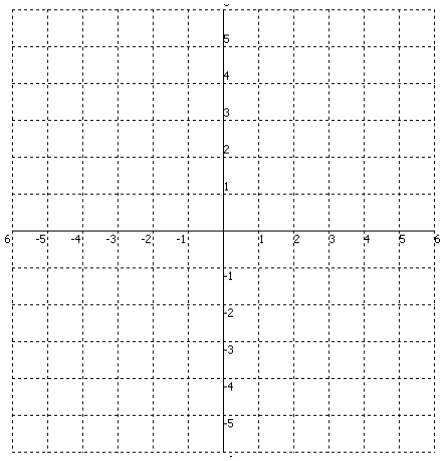
34. Solve $|8x - 7| = |-9|$

35. Solve $|6 + 9x| - 14 = -1$

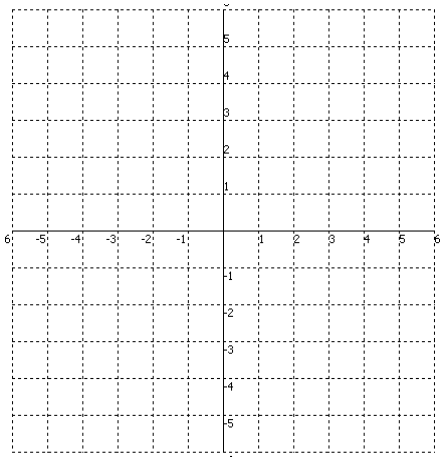
36. Solve $|9x + 6| + 12 = 3$

37. Solve $|5x + 4| = |6x - 2|$

38. Find the x-intercept and y-intercept of $2x - 5y = 10$. Then graph the equation.



39. Find the slope and y-intercept of the $3x + 2y = 6$. Then graph the equation.



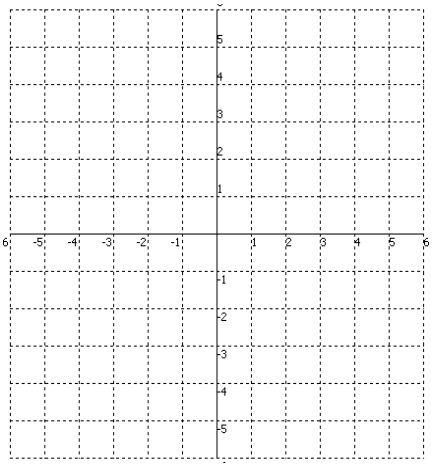
40. Find the slope of the line passes through (-1, 2) and (5, -4).

41. Find the equation of the line passes through (-1, 3) and (-2, -5). Write your answer in standard form.

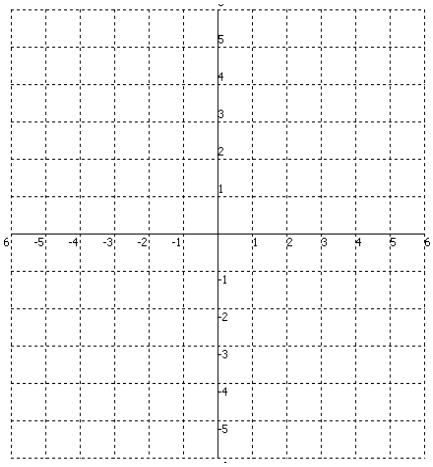
42. Find the equation of a line passes through (5, -6) with slope $\frac{3}{2}$. Write the equation in slope intercept form.

43. **Graph** and **find the slope** of the line.

(a) $y = -3$



(b) $x = 2$



44. Find the equation of a line perpendicular to the line $y = -2$ and passing through $(8,2)$.

45. Find the equation of a line parallel to the line $x = 3$ and passing through $(8,2)$.

46. Determine whether pair of lines is parallel, perpendicular or neither.

$$6 + 4x = 3y$$
$$3x + 4y = 8$$

47. If $f(x) = -2x^2 - x + 4$. Find $f(-2)$ and $f(1)$.

48. Which of the following set of ordered pairs does not represent the function? Circle the answer.

(a) $\{(1,1),(2,2),(-3,-3),(0,0)\}$

(b) $\{(11,1),(-1,-2),(0,0),(3,-2)\}$

(c) $\{(-1,0),(-1,6),(2,0),(2,2)\}$

(d) $\{(1,2),(3,2),(1,6),(3,9)\}$

49. Find the slope of a line perpendicular to the line described by $2x + 4y = 5$.

50. Find the equation of the function passing through the point (2, -2) and perpendicular to $8y = x - 16$. Write your answer in function notation.

51. Find the equation of the function passing through the point (-5, -9) and parallel to $3x + 5y = 8$. Write your answer in function notation.

52. Solve the system of equation by any correct method. $\begin{aligned} 4x - 3y &= 7 \\ 7x + 5y &= 2 \end{aligned}$

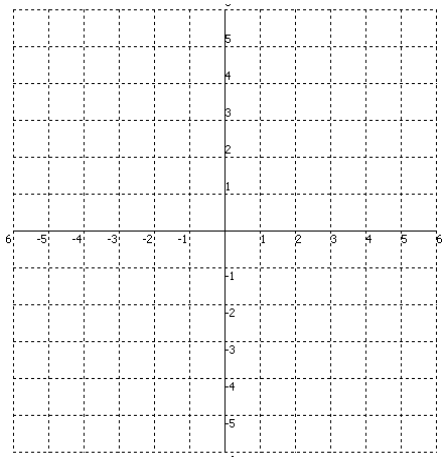
53. Solve the system of equation by any correct method. $\begin{aligned} 3x + 2y &= 49 \\ x &= 3y - 2 \end{aligned}$

54. Two angles are complementary if the sum of their measures is $90°$ Find the measures of two complementary angles if one angle is twenty nine times the other angle.

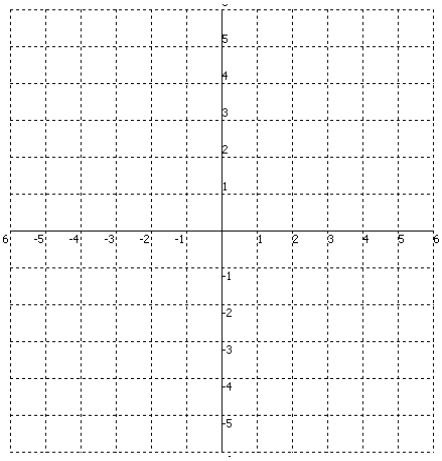
55. Jen has been pricing Speed Pass train fares for a group trip to New York. Three adults and four children must pay $117. Two adult and three children must pay $83. Find the price of the adult's ticket and the price of a child's ticket.

56. An office supply store sells 7 writing tablets and 4 pens for $6.40. Also, 2 tablets and 19 pens cost $5.40 find the price of each pen and tablet.

57. Graph the solution of the following system of linear inequalities. $\begin{aligned} 3x - 2y &\le 6 \\ y &< -3 \end{aligned}$



58. Graph the solution of the following inequality $-2x - 3y > -6$.



59. Multiply and simplify.

(a) $(9x^2 - 6)^2$ (b) $\left(x - \frac{5}{8}y\right)\left(x + \frac{5}{8}y\right)$ (c) $(x^2 + y)(9x - y^5)$ (d) $(2x^2 + 1)(5x^2 + 3)$

(e) $(a^2+2)(a^3-4a+5)$ (f) $(3x^2+1)^2$

60. Simplify each expression.

(a) $4^{-1}+4^{-2}$ (b) $\dfrac{(-4x\ y^{-2})^{-2}}{(x\ y^{-1})^{-1}}$ (c) $(-6x^6y^{-6})(9x^{-7}y^9)$ (d) $(-2a^5b^5)(7ab^4)^2$

(e) $\dfrac{4^{-1}(x^5)^2y^{-2}z}{(x^{-5})^{-4}y^{-5}z^{-3}}$ (f) $\dfrac{(2x^2y^4)^3}{3x^3y^3}$ (g) $\dfrac{2x^{-3}y^7}{(3x^{-6}y^2)^{-2}}$ (h) $\left(\dfrac{2x^3}{y^2}\right)^3\left(\dfrac{y^3}{8x}\right)$

61. Simplify each of the following expressions.

(a) $-5x^0$ (b) -3^0+4y^0 (c) $(-4)^{-3}$ (d) -3^2 (e) $-4^{-1}+3^{-1}$ (f) $\dfrac{(-3x^2y^3)^{-2}}{(x^4y^2z^3)^{-1}}$

(g) $-5^0(2m^2n^3)(3n^{-2}n)^{-2}$ (h) $\dfrac{-2xy^{-3}}{(xy^{-1})^{-2}}$

62. Write 0.00000167 in scientific notation.

63. Write 390,000 in scientific notation.

64. Write 2.197×10^{-7} in standard form.

65. Evaluate $(2.1\times10^{-6})(8\times10^{-4})$ and write the result in scientific notation.

66. Evaluate $\dfrac{5\times10^{-2}}{25\times10^{6}}$ and write the result in scientific notation.

67. Divide and simplify.

(a) $\dfrac{-4x^7+2x^4-8}{-2x^2}$ (b) $\dfrac{6x^2y\ +12x^2y^2-x\ y^2}{6xy}$

(c) $\dfrac{8x^2+49x+6}{x+6}$ (d) $\dfrac{-14x+49x^2-8}{7x-1}$

68. Factor completely.

(a) $8x^3-10x^2+20x-25$ (b) $x^3-4x+7x^2-28$ (c) $x^2-6x-27$

(d) $4x^3-20x^2-96x$ (e) $x^7-31x^6-32x^5$ (f) $4x^2-40x\ +96$

(g) $18x^3+29x^2+3x$ (h) x^4-13x^2+36 (i) $25x^2-16$

(j) x^4-81 (k) $10x^3+80$ (l) $8x^3-27$

69. Solve the following equations.

(a) $4x^3-x=0$ (b) $x^2-2x=35$ (c) $x(5x-2)=24$

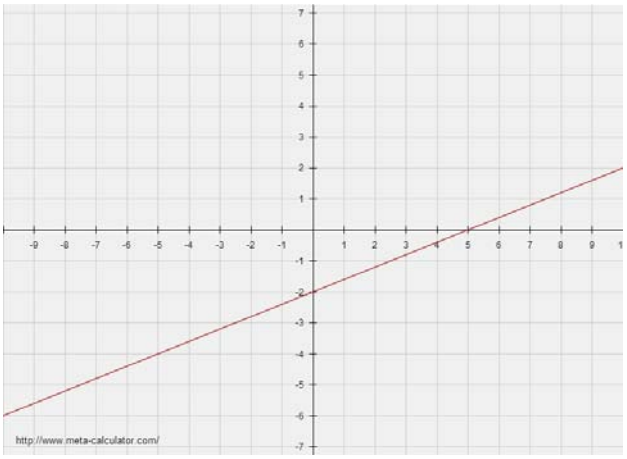
(d) $(x-2)(x+4)=-8$ (e) $3x^3+6x^2=24x$ (f) $2x^2-50=0$

70. The length of a rectangle is 18 inches less than five times its width. Its area is 35 square inches. Find the dimensions of the rectangle.
71. A diver jumps from a diving board that is 144 feet above the water. The height h (in feet) of the diver is modeled by the position equation $h = -16t^2 + 144$. Where t is time measured in seconds. How long will it take for the diver to reach the water?
72. A ladder is leaning against a building so that the distance from the ground to the top of the ladder is 8 feet less than the length of the ladder. Find the length of the ladder if the distance from the bottom of the ladder to the building is 16 feet.

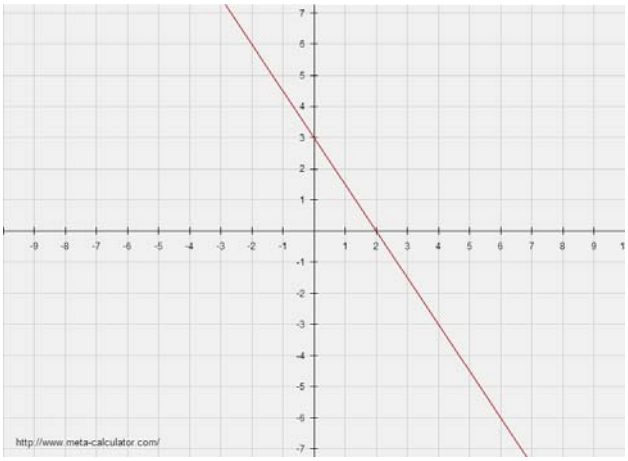
Elementary Algebra Answer Key

1. $\frac{21}{8}$ or $2\frac{5}{8}$
2. -118
3. 3
4. -2
5. $-13x - 4$
6. $2x + 19$
7. $-13x + 1$
8. $-10x^2y^2 - 2x^2y - 6xy - 4$
9. $-4x^2 - 6x$
10. $7x - 5$
11. 19
12. -16
13. $\frac{1}{5}$
14. a. $\frac{3}{2}$ b. 3 c. $\frac{2}{3}$ d. $\frac{-1}{4}, \frac{5}{2}$ e. $\frac{11}{4}$
15. y= $\frac{3x+6}{5x}$
16. b= $\frac{7c+2}{4a}$
17. F= $\frac{160+9C}{5}$
18. 19
19. 150%
20. 14
21. 72, 144, 29
22. x $\geq \frac{-5}{3}$
23. 4<x ≤ 5

24. $-9 \leq x \leq \frac{17}{2}$
25. 5<x<11
26.
27.
28.
29. 59°, 121°
30. 2 , 4, 9
31. $5—32 and $10--12
32. 60
33. 31,000
34. $\frac{-1}{4}$, 2
35. $\frac{-19}{9}$, $\frac{7}{9}$
36. No solution
37. $\frac{-2}{11}$, 6
38. X intercept (5,0), y intercept (0,-2)



39. m= $\frac{-3}{2}$, y intercept (0,3)

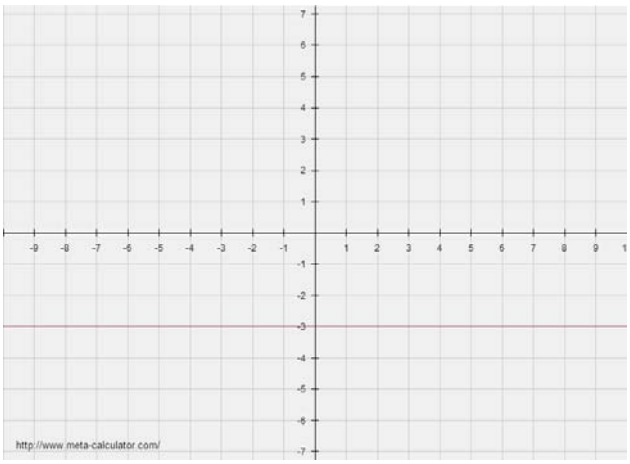


40.

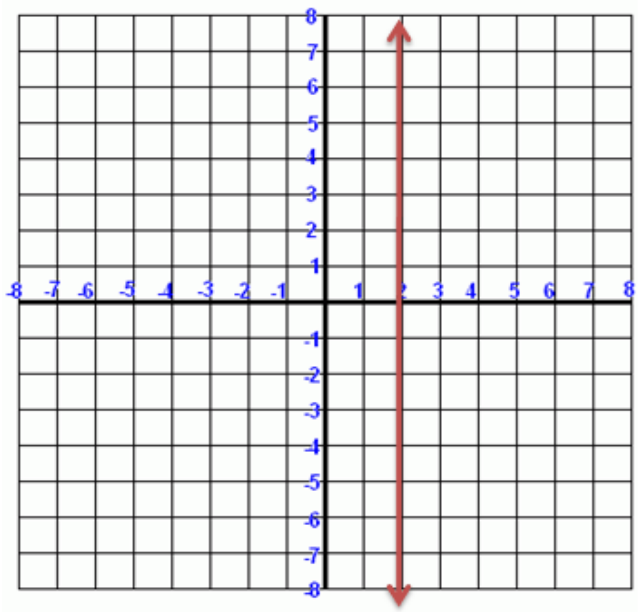
41.

42. y=$\frac{3}{2}$x-$\frac{27}{2}$

43. a) y=-3 ; slope = 0



b) x=2 ; Slope = undefined



44. x=8
45. x=8
46. Perpendicular
47.
48. d and c
49. m=2
50.

51. $\frac{-3}{5}$

52. (1,-1)

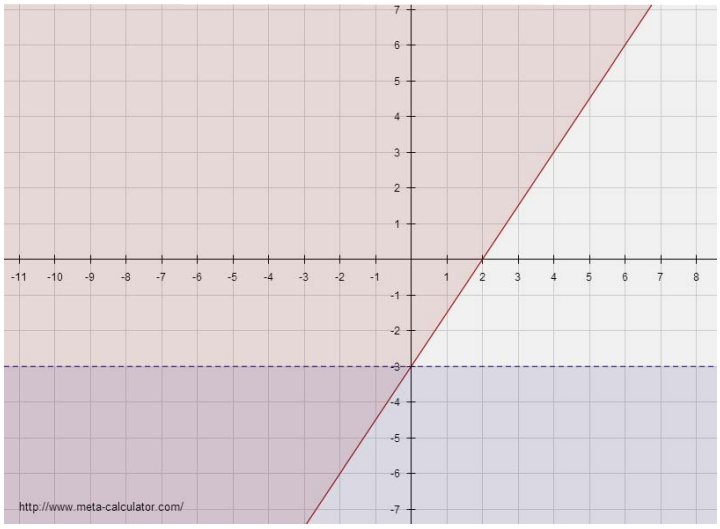
53. (13, 5)

54.

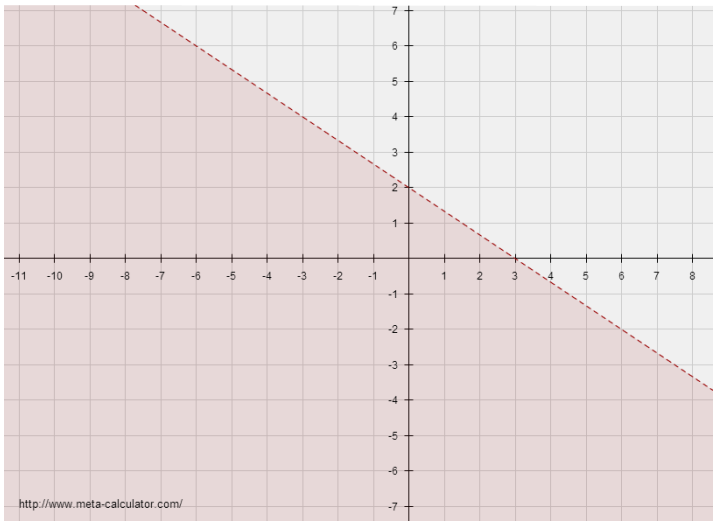
55. 19 and 15

56. 1 table- $0.80, 1 pen -$0.20

57.



58.



59. a. , b. $\frac{25}{64}$ c. d.

e. f.

60. a. $\frac{5}{16}$, b. $\frac{y^3}{16x}$ c. $\frac{-54y^3}{x}$ d. e. $\frac{y^3z^4}{4x^{10}}$ f. $\frac{8x^3y^9}{3}$

g. $\frac{18y^{11}}{x^{15}}$ h. $\frac{x^8}{y^3}$

61. a.-5, b. 3, c. $\frac{-1}{64}$ d. -9 e. $\frac{1}{12}$ f. $\frac{z^3}{9y^4}$ g. $\frac{-2m^2n^5}{9}$

h. $\frac{-2x^3}{y^5}$

62. $1.67x\ 10^{-6}$
63. 3.9×10^5
64. 0.0000002197
65. $1.68\ \times\ 10^{-9}$
66. 2×10^{-9}
67. A. $2x^5 - x^2 + \frac{4}{x^2}$ b. $x + 2xy - \frac{y}{6}$ c. $8x + 1$ d. $7x - 1 - \frac{9}{7x-1}$
68. a.$(4x - 5)(2x^2 + 5)$ b.$(x - 2)(x + 2)(x + 7)$ c. $(x + 3)(x - 9)$ d. $4x(x - 8)(x + 3)$
e. $x^5(x - 32)(x + 1)$ f. $4(x - 6)(x - 4)$ g. $x(2x + 3)(9x + 1)$
h. $(x - 3)(x - 2)(x + 2)(x + 3)$ i. $(5x - 4)(5x + 4)$ j. $(x - 3)(x + 3)(x^2 + 9)$
k. $10(x + 2)(x^2 - 2x + 4)$ l. $(2x - 3)(4x2 - 6x + 9)$
69. a. $\frac{-1}{2}$, 0, $\frac{1}{2}$ b. -5,7 c.-2, $\frac{12}{5}$ d. -2,0 e.-4,0,2 f. -5,5
70. width = 5, length = 7
71. t = 3 sec
72. 20 ft.