

Woodland Community College

PREPARING FOR THE MATH ASSESSMENT

The math assessment is an important step for students who want to take math courses. Math courses are required for all degrees.

To prepare;

- Take a practice test
 - There are four practice tests;
 - Basic Math
 - Pre-Algebra
 - Elementary Algebra
 - Intermediate Algebra

Note: See <http://wcc.yccd.edu/admissions/assessment.aspx>

- Refresh your math skills
 - Review math text books
 - Practice example problems
 - Test your self

Check other online resources

- Math TV: <http://www.mathtv.com>
- Purple Math: <http://www.purplemath.com>
- Khan Academy: <http://www.khanacademy.org>
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- **Other helpful hints:** Come to the assessment test after a good nights sleep and with some food in your stomach. Schedule the assessment when you have time to focus. Don't schedule anything right before or after. The assessment is not timed.

During the assessment....

- Read the instructions very carefully.
- Check your answers before you submit them.
- Remain calm, and maintain a positive attitude.

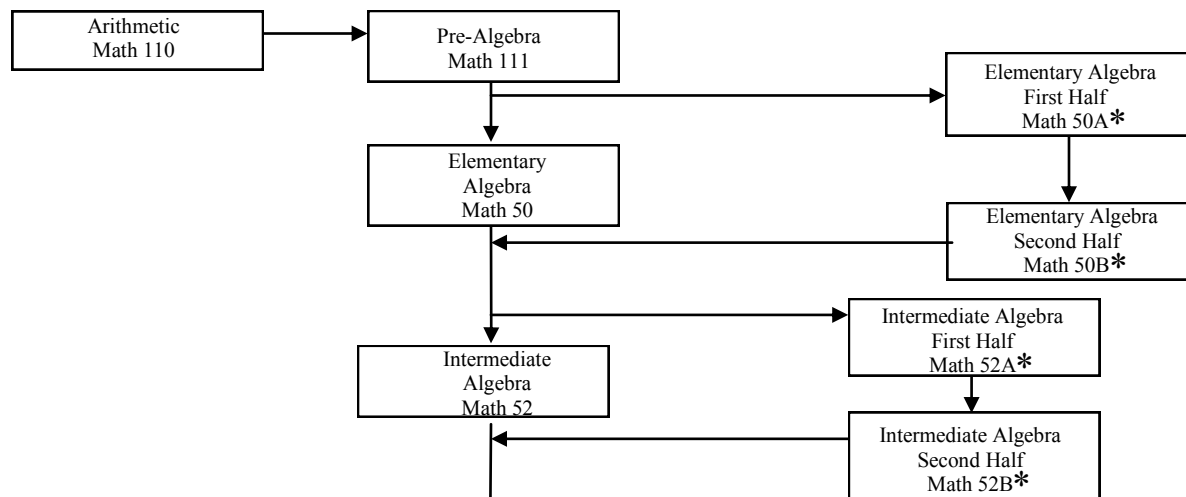
After the assessment...

If you are not satisfied with your score you can do the following:

- Practice more
- Repeat the assessment – You are allowed to retake the assessment after one month.
Note: You can only take the assessment three times in a two years period and not more than three times a semester.

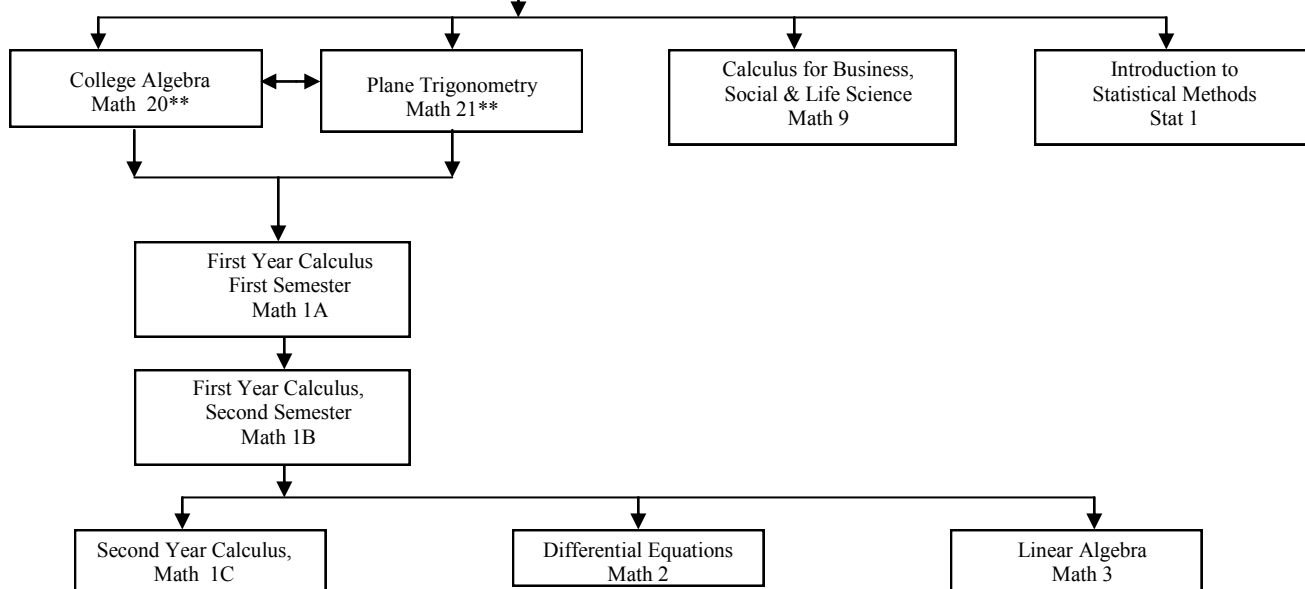
Mathematics & Statistics Course Sequencing

Woodland Community College



**** These classes could be taken in any order, but must be taken before Math 1A**

*** These A-B classes not available due to budget.**



Online Resources

- **Algebra**
 - <http://www.algebrahelp.com/>
 - <http://www.purplemath.com/>
 - http://www.myalgebra.com/algebra_solver.aspx
- **Trigonometry**
 - <https://www.khanacademy.org/math/trigonometry/basic-trigonometry>
 - <http://www.sosmath.com/trig/trig.html>
- **Calculus**
 - <http://www.calculus-help.com/>
 - <http://www.sosmath.com/calculus/calculus.html>
- **Others**
 - <http://www.mathtv.com>
 - <http://www.khanacademy.org>
 - www.purplemath.com
 - <http://www.interactmath.com/>

Woodland Community College: Math Practice Test

Basic Math Test (Arithmetic)

The following problems are recommended practice problems for the arithmetic 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 of the problems, we suggest that you review those topics before you take the test.

Do not use the calculator to do these problems.

(1-6) Perform the indicated operation.

1. $2817 + 7258$
2. $7305 - 5279$
3. 51×27
4. $9857 \div 27$
5. $6^2 \div 3 \bullet 2 - (4 + 2 \bullet 5)$
6. $2 + 5[10 \div 5 \cdot 2 + 3^2 - (6 + 4)]$
7. If the quotient of 546 and 6 is subtracted from 100, what is the difference?
8. Evaluate the following:

(a) $15^2 =$

(b) $8^3 =$

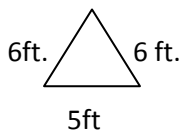
(c) $11^0 =$

(d) $1^{40} =$

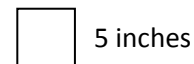
9. On a history exam, two students scored 98 points, five students scored 87 points, one student scored 81 points, and six students scored 75 points. What was the average score of the class?

10. Find the perimeter of each shape.

a. Triangle:



b. Square:



11. Solve $21 + x = 95$

12. Solve $7y = 343$

13. Find the prime factorization of the numbers

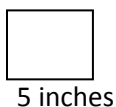
(a) 98

(b) 150

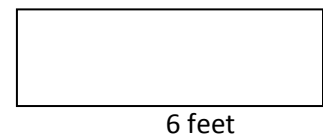
(c) 108

14. Find the area of the each shape.

a)



b) 3 feet



15. Perform the indicated operations and simply the answer.

(a) $\frac{10}{18} \bullet \frac{9}{5}$

(b) $\frac{21}{5} \div 3$

(c) $\frac{5}{12} \div \frac{15}{16}$

(d) $\frac{3}{8} + \frac{5}{16}$

(e) $5 - \frac{3}{4}$

(f) $\frac{14}{27} - \frac{7}{18}$

(g) $\frac{5}{8} \cdot \frac{1}{10} \div \frac{3}{4} + \frac{1}{6}$

(h) $\frac{4}{5} - \left(\frac{1}{2}\right)^2 + \frac{1}{10}$

(i) $\frac{1}{3} \cdot \frac{5}{6} + \left(\frac{1}{3}\right)^2 \div 2$

16. A recipe calls for $\frac{3}{4}$ cup of flour. How much flour should be used if only half the recipe is to be made?

17. Suppose that a ball is dropped from a height of 20ft. If the ball bounces back to $\frac{5}{8}$ the height from which it was dropped, how high will it bounce on its third bounce?

18. Find the sum of $\frac{1}{4}$ and $\frac{3}{16}$. Subtract $\frac{1}{8}$ from the sum. What is the difference?

19. Find the quotient of $\frac{3}{4}$ and $\frac{15}{16}$. Add $\frac{3}{10}$ to the quotient. What is the sum?

20. Arrange the numbers in order from smallest to largest. $\frac{1}{3}, \frac{5}{42}, \frac{3}{7}$

21. (a) Change $\frac{56}{18}$ to a mixed number. (b) Change $10\frac{8}{12}$ to an improper fraction.

22. A tree in Yosemite National park grew $\frac{2}{3}$ foot, $\frac{3}{4}$ foot, $\frac{7}{8}$ foot and $\frac{1}{2}$ foot in four consecutive years. How many feet did the tree grow during these four years?

23. Find the product of the following and reduced if possible.

(a) $6\frac{1}{4} \cdot 3\frac{3}{5}$

(b) $2\frac{1}{4} \cdot 6\frac{3}{8} \cdot 1\frac{5}{27}$

24. Divide and reduce to lowest terms if possible.

(a) $\frac{5}{6} \div 3\frac{1}{4}$

(b) $5\frac{5}{6} \div \frac{1}{2}$

(c) $4\frac{1}{5} \div 3$

25. Add or subtract and reduced your answer if possible.

(a) $7\frac{3}{5} + 2\frac{1}{8}$

(b) $5\frac{11}{12} - 1\frac{1}{4}$

(c) $14\frac{6}{10} - 3\frac{4}{5}$

(d) $12 - 4\frac{1}{5}$

26. Evaluate the following using order of operations

(a) $\frac{3}{5} \cdot \frac{1}{6} + \frac{1}{5} \div 2$

(b) $\left(2 - \frac{1}{3}\right) \div \left(1 - \frac{1}{3}\right)^2$

(c) $\frac{3}{10} + \frac{5}{6} \div \frac{1}{4} \cdot \frac{1}{8} - \frac{7}{60}$

27. Find the average of the numbers $\frac{7}{8}, \frac{9}{10},$ and $1\frac{3}{4}$

28. Solve $x + \frac{2}{3} = \frac{11}{6}$

29. Round each of the numbers as indicated.

- (a) 76.352 to nearest tenth. (b) 8.99613 to nearest hundredth.
(c) 649.66 to nearest whole number

30. Add or subtract as indicated.

- (a) $2.051 + 0.2006 + 5.4 + 37$ (b) $5.2 - 3.76$

31. Find the product.

- (a) 0.23×0.12 (b) 0.27×6.1

32. To buy a car, you can pay \$2036.50 in cash or you can put down \$400 and make 18 monthly payments of \$104.30. How much would you save by paying cash?

33. Divide

- (a) $82.24 \div 0.04$ (b) $34 \div 1.62$ (round the answer to nearest hundredths)

34. Change each decimal to fraction form or mixed number form and reduce if possible.

- (a) 0.225 (b) 8.15

35. Change each fraction to decimal form rounded to nearest hundredths place. (a) $\frac{16}{13}$ (b) $\frac{7}{24}$

36. Converting from percent notation to decimal notation. (a) 35% (b) 24.5%

37. Converting from a decimal to a percent. (a) 0.325 (b) 0.6

38. Solve $\frac{x}{3} = \frac{4}{6}$

39. Solve $4\frac{2}{3} = \frac{14}{x}$
 $5\frac{1}{2} = x$

40. How high is a tree that casts a 32 ft shadow at the same time that an 8 ft light pole casts a 9 ft shadow?

41. Converting from fractional notation to percent notation. (a) $\frac{3}{5}$ (b) $\frac{3}{8}$

42. Converting from percent to fractional notation. (a) 36% (b) $16\frac{2}{3}\%$

43. 12% of 50 is what number?

44. 40% of what number is 28?

45. What percent of 50 is 16?

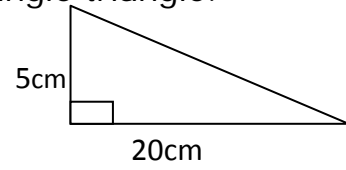
46. Tom paid \$3780 in local taxes. This is 9% of his income. How much did Tom make?

47. Ram got an 80 on a math test. On the next test, he got an 84. What is percent of increase?

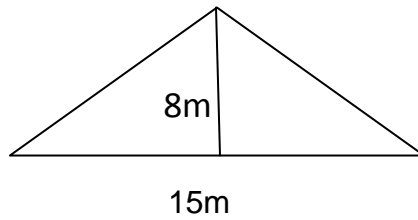
48. A 17ft ladder leans against a building. The bottom of the ladder is 3ft from the building. How high is the top of the ladder?

49. A wheel on a bicycle is 24 inches in diameter. What is the area and circumference of the wheel? (Use $\pi = 3.14$)

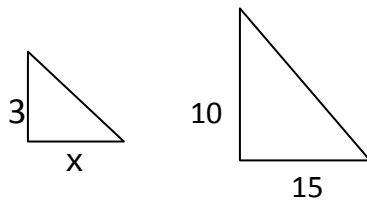
50. Find the length of the hypotenuse of the given right angle triangle.



51. Find the area of the given triangle.



52. The triangles in each exercise are similar. Find the missing length.



Math Practice Test answers

Basic Math test (Arithmetic)

- 10075
- 2026
- 1377
- 365 R 2
- 10
- 17
- 9
- (a) 225 (b) 512 (c) 1 (d) 1
- 83
- (a) 17ft (b) 20 in
- 74
- 49
- (a) $98 = 2 \cdot 7 \cdot 7$ (b) $150 = 2 \cdot 3 \cdot 5^2$ (c) $108 = 2 \cdot 2 \cdot 3 \cdot 3 \cdot 3$ or $2^2 \cdot 3^3$
- (a) 25 sqin (b) 18 sqft
- (a) 1 (b) $\frac{7}{5} = 1\frac{2}{5}$ (c) $\frac{4}{9}$ (d) $\frac{11}{16}$ (e) $\frac{17}{4} = 1\frac{1}{4}$ (f) $\frac{7}{54}$ (g) $\frac{1}{4}$ (h) $\frac{13}{20}$ (i) $\frac{8}{27}$
- $\frac{3}{8}$ cup
- $\frac{625}{128} ft = 4\frac{113}{128} ft$
- $\frac{5}{16}$
- $\frac{11}{10} = 1\frac{1}{10}$
- $\frac{5}{42}, \frac{1}{3}, \frac{3}{7}$
- (a) $3\frac{1}{9}$ (b) $\frac{32}{3}$
- $\frac{67}{24} ft = 2\frac{19}{24} ft$
- (a) $\frac{45}{2} = 22\frac{1}{2}$ (b) 17
- (a) $\frac{10}{39}$ (b) $\frac{35}{3} = 11\frac{2}{3}$ (c) $\frac{7}{5} = 1\frac{2}{5}$
- (a) $9\frac{29}{40}$ (b) $4\frac{2}{3}$ (c) $10\frac{4}{5}$ (d) $7\frac{4}{5}$
- (a) $\frac{1}{5}$ (b) $3\frac{3}{4}$ (c) $\frac{3}{5}$
- $1\frac{7}{40}$

28. $\frac{7}{6} = 1\frac{1}{6}$

29. (a) 76.4 (b) 9.00 (c) 650

30. (a) 44.6516 (b) 1.44

31. (a) 0.0276 (b) 1.647

32. \$240.90

33. (a) 2056 (b) 20.99

34. (a) $\frac{9}{40}$ (b) $8\frac{3}{20}$

35. (a) 1.23 (b) 0.29

36. (a) 0.35 (b) 0.245

37. (a) 32.5% (b) 60%

38. $x = 2$

39. $x = 16\frac{1}{2}$

40. $28\frac{4}{9} ft$

41. (a) 60% (b) 37.5%

42. (a) $\frac{9}{25}$ (b) $\frac{1}{6}$

43. 6

44. 70

45. 32%

46. \$42,000

47. 5%

48. $\sqrt{280} ft$

49. area = 452.16 sqin circumference = 75.36in

50. $\sqrt{425} cm$

51. 60sqm

52. $x = \frac{9}{2} = 4\frac{1}{2}$

Woodland Community College: Math practice Test

Pre-algebra Math test

The following problems are recommended practice problems for the pre-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 have struggle completing the problems, we suggest that you review these topics before taking the test.

Do not use the calculator to do these problems.

1. Insert the appropriate symbol in each blank that will make each statement true: $<$, $>$, or $=$.

a) $5 \underline{\hspace{1cm}} 7$ b) $-3 \underline{\hspace{1cm}} 2$ c) $-4 \underline{\hspace{1cm}} -2$ d) $0 \underline{\hspace{1cm}} -7$ e) $|-6| \underline{\hspace{1cm}} 6$

2. Perform the indicated operations.

(a) $(-3) + (-5)$ (b) $20 + (-7)$ (c) $(-10) + (-6) + 8$ (d) $20 - 25$ (e) $-10 - 14$ (f) $-6 - (-5)$

3. Multiply or divide.

a) $-2(5)$ b) $(-3)(-6)$ c) $(4)(-4)(-10)$ d) $\frac{-21}{3}$ e) $\frac{-15}{0}$

4. Find the value of the expressions using the rules for order of operations.

a) $6 \cdot 8 \div (-4) + 9$

b) $7 \cdot 2^3 + 3^2 - 4^2 - 4(6 - 2 \cdot 3)$

c) $-36 \div (-2)^2 + 15 - 2(16 - 17)$

d) $(7 - 10)[49 \div (-7) + 20 \cdot 3 - 4 \cdot 15 - (-10)]$

5. Simplify each of the following expressions by combining like terms. (a) $-3(2x - 5) + 2(3x - 4) - 9 + 6x$

(b) $-13(2x^2)$ (c) $3a^2b + 7a^2b + 6ab - 3ab$ (d) $3(x - 1) - 2(x + 1)$

6. Evaluate $2y^2 - 6y - 5$ for $y = -2$.

7. Perform the indicated operations.

(a) $\frac{-2}{3} \div (-12)$ (b) $-16 \cdot 2\frac{1}{4}$ (c) $-\frac{5}{16} \div \frac{3}{8}$

(d) $5\frac{3}{5} \div \left(\frac{-7}{10}\right)$ (e) $-\frac{7}{8} + \frac{2}{3}$ (f) $-\frac{7}{12} - \frac{5}{8}$

(g) $-\frac{5}{9} - \left(\frac{-11}{12}\right)$ (h) $6\frac{2}{3} - 1\frac{7}{8}$

$$(i) \frac{\frac{3}{4}}{\frac{-5}{6}}$$

8. Simplify. (a) $\frac{5}{8} \div \frac{1}{10} + \left(\frac{1}{3}\right)^2 \cdot \frac{3}{5}$

(b) $\frac{5}{8} \cdot \frac{3}{2} - \left(\frac{3}{4}\right)^2$

(b) $\frac{7}{20} - \left(\frac{1}{10} - \frac{2}{5}\right)^2$

9. Solve the following equations.

(a) $-5x - 3 = 9$

(b) $-\frac{5}{3}x + \frac{1}{2} = \frac{3}{4}$

(c) $-\frac{1}{2}(x+1) = \frac{1}{3}(x-1)$

(d) $-2 - 5(x-3) = 8$

(e) $9x + 2 = 6x - 13$ (f) $6 - 1(2 + 3x) - (-4x) = -3(x - 2) - 4$ (g) $-\frac{3}{5}y = \frac{12}{10}$ (h) $\frac{4}{5} = -\frac{2}{3} - 11x$

10. In each pair of numbers, which number is larger?

a) 258.068, 258.86

b) $-0.574, -0.575$

11. A student missed 6 problems on a mathematics test and received a grade of 85%. If all the problems were of equal value, how many problems were on the test?

12. Evaluate $-2x - y + 4$ for $x = -4$ and $y = 3$

13. Write the decimal 29.45 as a mixed number in the lowest terms.

14. Write 0.0107 in words.

15. Arrange in the order from the smallest to largest. $0.63, 0.631, \frac{3}{5}, \frac{9}{16}, 0.6299$.

16. A circle has diameter 44yd. Find the circumference of the circle. Use $\pi = 3.14$.

17. Find the circumference of a circle with radius 4inch. (Use $\pi = 3.14$).

18. John bought 9.85 pounds of apples at \$4.25 per pound. How much did he pay to nearest cent?

19. Find the unknown number in the following proportion. (a) $\frac{3\frac{1}{5}}{9} = \frac{16}{x}$ (b) $\frac{6\frac{1}{4}}{5} = \frac{45}{x}$

20. If Tom can run x miles in 15 minutes, how far can he run in 45 minutes?

21. A salon plays taped music constantly. Each tape plays for $1\frac{1}{4}$ hours. How many tapes are played during $8\frac{3}{4}$ hours?

22. Carmen loaned \$ 5000 to a friend for 6 months at an interest rate of 8%. Find the simple interest.

23. How much cash would you need to buy a used car for \$6000 if the sales tax is calculated at 5%, the license fee is \$9, and your credit union will let you borrow 80% of your expenses?

24. Twice a number plus 5 is equal to 20 more than the number. What is the number?

25. Twice the difference between a number and 5 is equal to 6 times the number plus 14. What is the number?

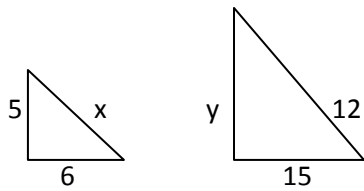
26. Sven less than four times a number is equal to twice the number increased by three. Find the number.
27. Find the three consecutive odd integers such that the sum of the first and third is equal to 27 less than 3 times second.
28. It takes $\frac{3}{4}$ yd of ribbon to make bow. How many bows can be from 9 yards of ribbon?
29. One side of the triangle is 2 ft more than another side and the third side is 5 ft less than the less than the sum of the other two sides. If the perimeter is 55 ft, what is the length of each side?
30. Round 13.0693 to the nearest hundredth.
31. Evaluate $-4s^2r$ when $r = 6$ and $s = -3$
32. Find the perimeter of a rectangular floor that measures 12ft by 9ft.
33. Find the complement of a 42° angle.
34. Find the supplement of 68° angle.
35. Write 32% as a decimal.
36. Write 0.3125 as a percent.
37. Write $\frac{7}{8}$ as a percent.
38. 520 is what percent of 2600/
39. Find the sale price of an item whose original cost is \$96 and the rate of discount is 12%.
40. Convert 21qt to gallons.
41. Convert 27in to feet.
42. Convert 7mm to centimeters.
43. Convert 2.96g to milligrams.
44. Fill in the missing values.
- (a) $65\text{cm} = \underline{\hspace{2cm}}\text{m}$ (b) $9.6\text{cm}^2 = \underline{\hspace{2cm}}\text{mm}^2$
45. A loan of \$2,000 is due in 6 months with annual interest rate of 10%. Find the total amount that will be due.
46. Translate the following sentence into an equation and solve it: when 3 times a number is decreased by 11, the result is twice the number minus 7.
47. The width of a rectangular garden plot is 4ft less than the length. The perimeter of the plot is 44ft. fund the length and width.
48. Evaluate (a) $2^{-1} - 5^{-1}$ (b) $3^{-1} - 2^{-2} + 5^0$
49. simplify (a) $(5x^2)(-3x^4)$ (b) $-2x(x^2y^3)^2$
50. Write 0.00012589 in scientific notation.
51. Write 25,869,000 in scientific notation.
52. Write 5.245×10^{-4} in standard form.
53. Write 1.00125×10^5 in standard form.

54. Simplify each expression so that answer conations only nonnegative exponents.

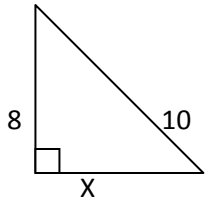
(a) $(x^{-5})^3$ (b) $(y^3 \bullet y^2)^0$ (c) $t^{-2} \bullet t^{-3} \bullet t^{-4}$ (d) $\frac{x^6}{x^3}$ (e) $\frac{x^6}{(x^{-2})^{-4}}$

55. Perform the indicated operations (a) $(3x-7)(x-1)$ (b) $(x-2)^2$ (c) $-2x(5x^2-3x-7)$
(c) $(2x-5)^2$ (d) $(-4x^3+7x^2-2x+8)-(6x^3-7x^2+2x-7)$

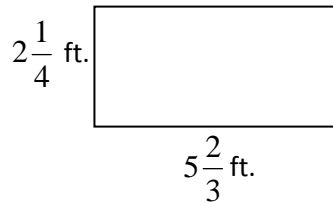
56. The triangles in each exercise are similar. Find the missing length.



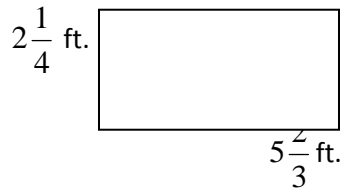
57. Find the missing leg of the given right angle triangle.



58. Find the area of the rectangle below.

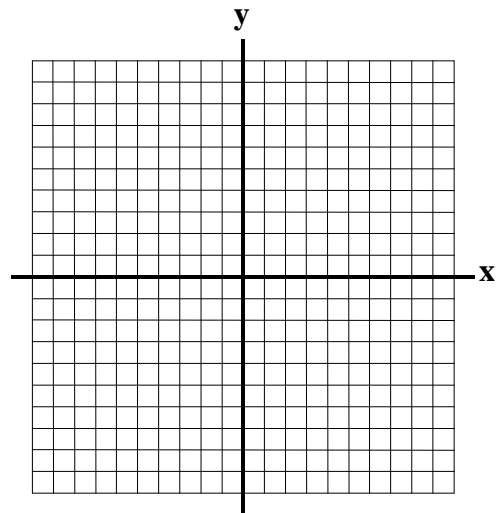


59. Find the perimeter of the rectangle.



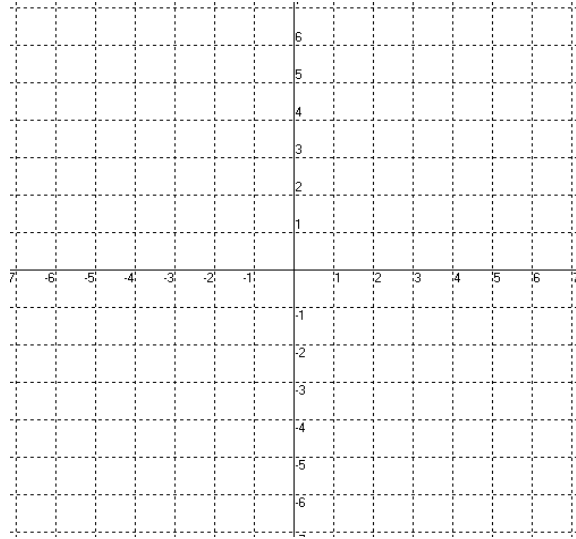
60. For the given linear equation fill in the table so that the corresponding points will lie on the graph of the given equation and then graph the line for that equation. $-2x + 3y = 6$

x	y	(x,y)
0		
3		
	0	



61. For the equation $y = 2x - 3$, complete the table below, and then graph the equation in the rectangular coordinate system. Label each of your ordered pairs on the graph.

x	y	(x,y)
-1		
0		
	5	



Math practice Test answers

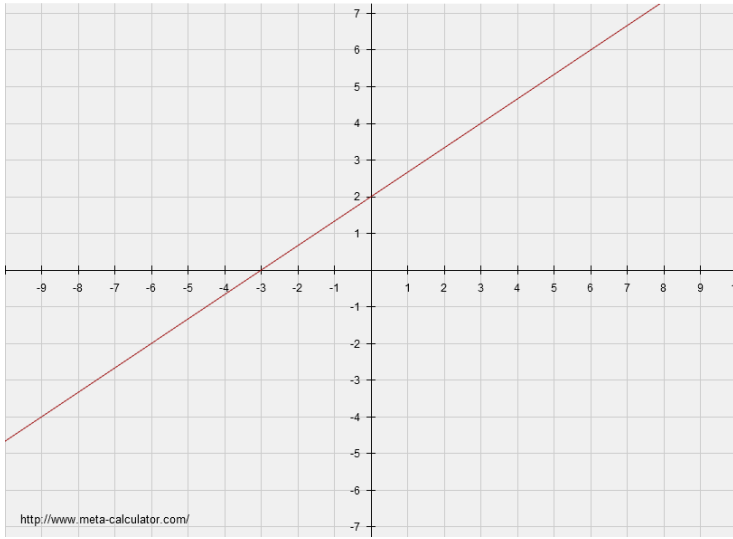
Pre-algebra Math test

- a) <, b) <, c) <, d) > e) =
- a) -8, b) 13, c) -8, d) -5, e) -24, f) -1
- a) -10, b) 18, c) 160, d) -7 e) undefined
- a) -3, b) 49, c) 8, d) -9
- a) $6x-2$, b) $-26x^2$, c) $10a^2 b+3ab$, d) $x-5$
- 15
- a) $1/18$, b) -36, c) $-5/6$, d) -8, e) $-5/24$, f) $-29/24$, g) $13/36$, h) $19/24$ i) $-9/10$
- a) $6 \frac{19}{69}$, b) $3/8$, c) $13/50$,
- a) $-12/5$, b) $-3/20$, c) $-1/5$, d) 1, e) -5, f) $-1/2$, g) -2, h) $-2/15$
- a) 258.86, b) -0.574
- 40
- 9
- $29 \frac{9}{20}$
- One hundredth seven
- $9/16$, $3/5$, 0.6299, 0.63, 0.631
- 138.16 yd
- 25.12 inch
- \$41.86
- a) 45, b) 36
- $3x$
- 7
- \$200
- \$ 1261.80
- 15

25. -6
 26. 5
 27. 25,27,29
 28. 12
 29. 14,16,25
 30. 13.07
 31. -216
 32. 42
 33. 48
 34. 112
 35. 0.32
 36. 31.25%
 37. 87.5%
 38. 20%
 39. 84.48
 40. 5.25
 41. 2.25
 42. 0.7
 43. 2960
 44. a) 0.65m, b) 960 mm²
 45. 2100
 46. 4
 47. 13by9
 48. a) 3/10, b) 13/12
 49. -15x⁶ b) -2x⁵y⁶
 50. 1.2589x10⁻⁴
 51. 2.5869x10⁷
 52. 0.0005245
 53. 100125
 54. a) 1/x¹⁵, b) 1, c) 1/t⁹, d) x³, e) 1/x²
 55. a) 3x²-10x+7, b) x²-4x+4, c) -10x³+6x²+14x, d) 4x²-10x+25, e) -10x³+14x²-4x+15
 56. x=4.8, y=12.5
 57. x=6
 58. 12 $\frac{3}{4}$ sq ft
 59. 15 $\frac{5}{6}$

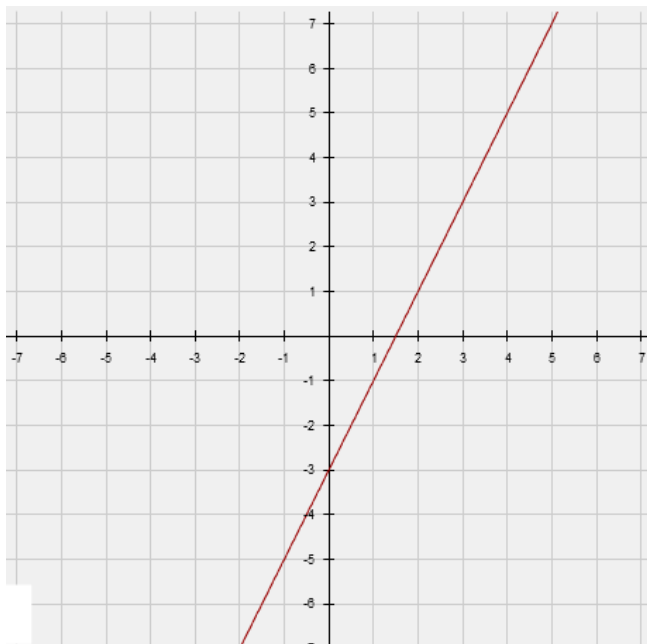
60.

x	y	(x,y)
0	2	(0,2)
3	4	(3,4)
-3	0	(-3,0)



61.

x	y	(x,y)
-1	-5	(-1,-5)
0	-3	(0,-3)
4	5	(4,5)



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. $(120 - 6^2) \div (4 \cdot 8)$

2. $\frac{2^3 - 3^2 + 12 \cdot 5}{-32 \div (-16) \div (-4)}$

3. $(-4)^2 - (3^3 - 2(6) + (-4 + 2))$

4. $|-8 - 2| + |-4| - |-16|$

5. $(-4x^2 - 5x + 2) + (3x^2 - 6x + 1) - (-x^2 + 2x + 7)$

6. $5(x + 3) - (3x - 4)$

7. $10 - 3(2x + 3) - 7x$

8. $(3x^2y - 6xy + x^2y^2 - 5) - (11x^2y^2 - 1 + 5yx^2)$

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 $\frac{x^2 - y^2}{(x - y)^2}$ when $x = 3$ and $y = -2$

14. Solve each equation. (a) $2(4x - 5) - 4(4 - 2x) = -2$ (b) $\frac{4x - 7}{5} = 2 - (4 - y)$

(c) $5(3x - 2) - 2x = 6 - 2(3 + x)$ (d) $\frac{8}{3}x - 2 = \frac{5}{3x} + 4$ (e) $\frac{3}{4}(8x - 12) = \frac{1}{2}(4x + 4)$

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?

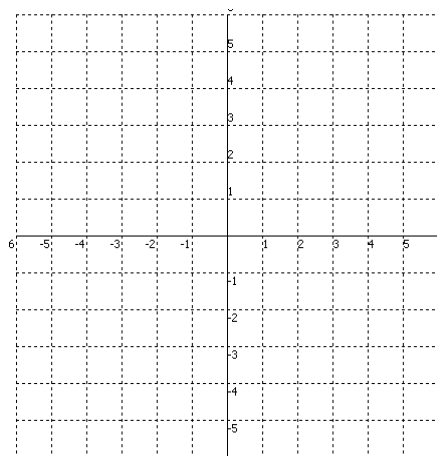
19. 75 is what percent of 50?

20. Three times a number minus 6 is equal to two times a number plus 8. Find the number.

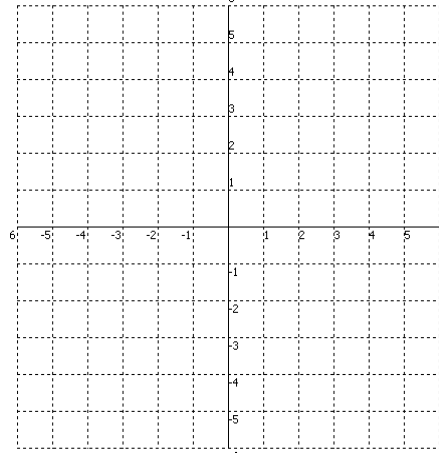
21. A flower bed is in the shape of a triangle with one side twice the length of the shortest side and the third side is 30 feet more than the length of the shortest side. Find the dimensions if the perimeter is 102 feet.

22. Solve $-3x + 2 \leq 7$

23. Solve $2 < 3x - 10 \leq 5$
24. Solve $-3 \leq \frac{-2x + 2}{5} \leq 4$
25. Solve $-2x < -10$ and $x - 3 < 8$
26. Solve $x + 6 < 0$ or $4x > -16$
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 $(5, -4)$.

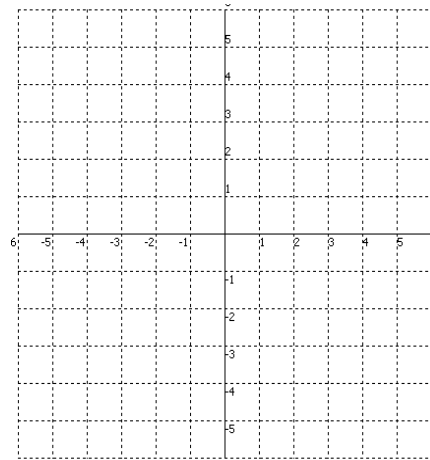
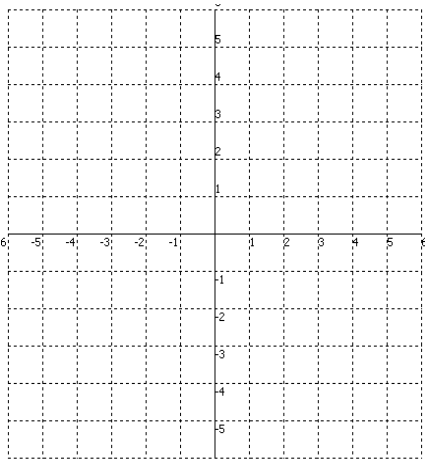
41. Find the equation of the line passes through $(-1, 3)$ and $(-2, -5)$. Write your answer in standard form.

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.

$$4x - 3y = 7$$

$$7x + 5y = 2$$

53. Solve the system of equation by any correct method.

$$3x + 2y = 49$$

$$x = 3y - 2$$

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.

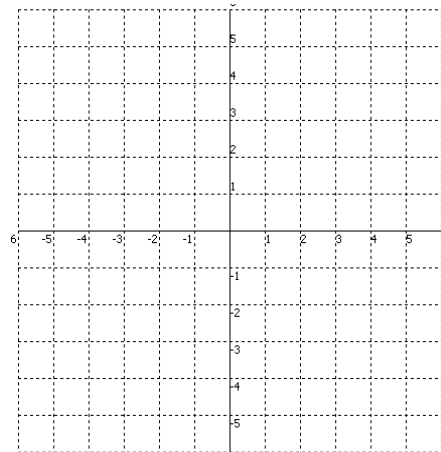
55. Jen has been pricing Speed Pass train fares for a group trip to New York. Three adults and four children must pay \$117. Two adult and three children must pay \$83. Find the price of the adult's ticket and the price of a child's ticket.

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.

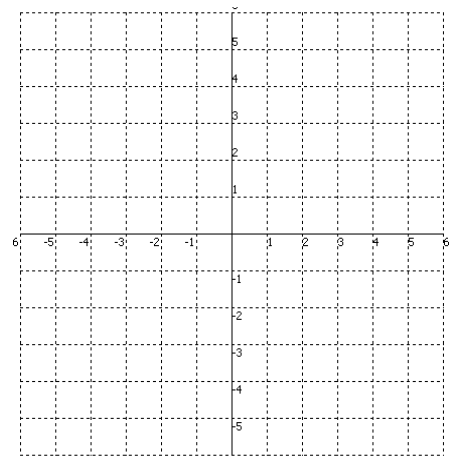
57. Graph the solution of the following system of linear inequalities.

$$3x - 2y \leq 6$$

$$y < -3$$



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

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

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) $\frac{(-3x^2 y^3)^{-2}}{(x^4 y^2 z^3)^{-1}}$

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

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 $(2.1 \times 10^{-6})(8 \times 10^{-4})$ and write the result in scientific notation.

66. Evaluate $\frac{5 \times 10^{-2}}{25 \times 10^6}$ and write the result in scientific notation.

67. Divide and simplify.

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

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

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. $4 < x \leq 5$

24. $-9 \leq x \leq \frac{17}{2}$

25. $5 < x < 11$

26.

27.

28.

29. $59^\circ, 121^\circ$

30. 2, 4, 9

31. \$5—32 and \$10--12

32. 60

33. 31,000

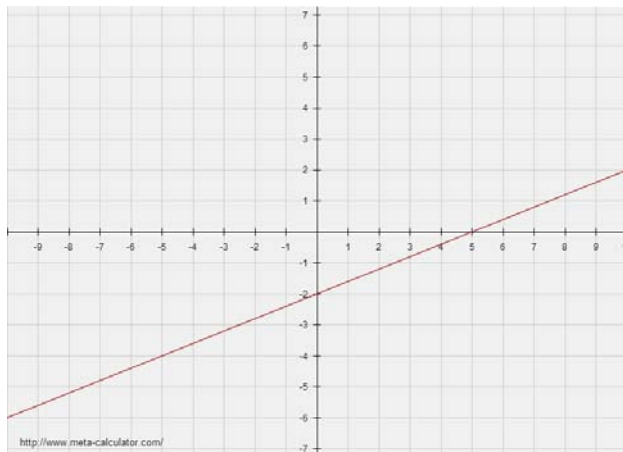
34. $\frac{-1}{4}, 2$

35. $\frac{-19}{9}, \frac{7}{9}$

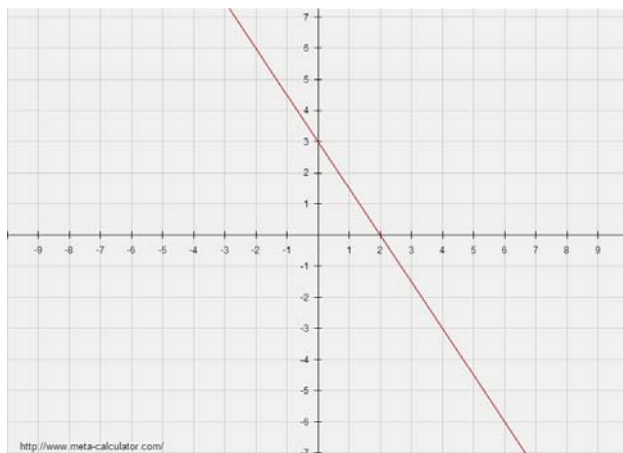
36. No solution

37. $\frac{-2}{11}, 6$

38. X intercept (5,0), y intercept (0,-2)



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

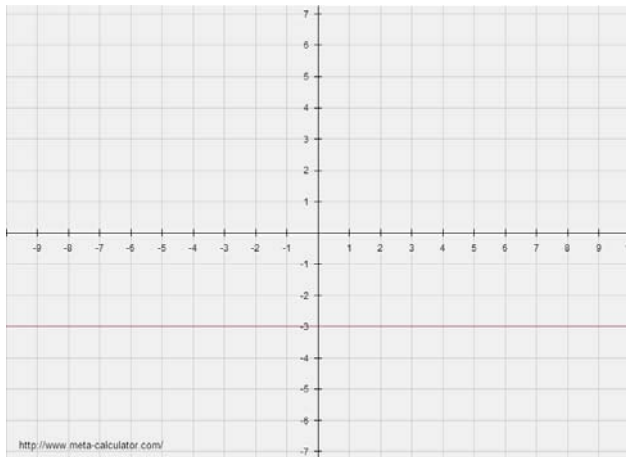


40.

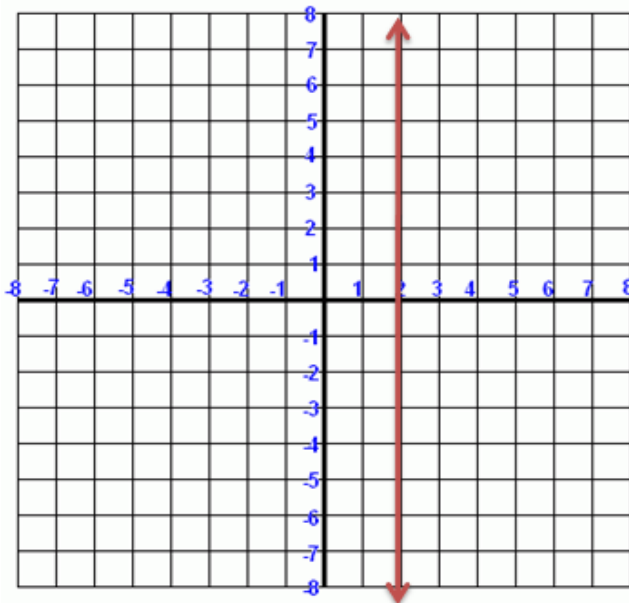
41.

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

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)

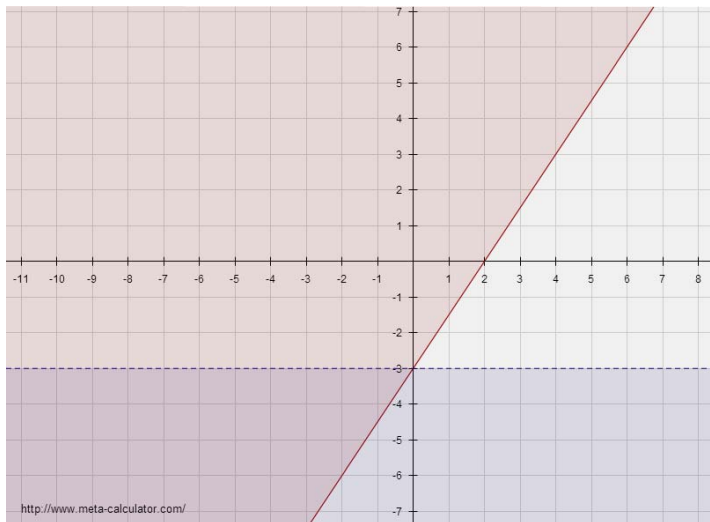
53. (13, 5)

54.

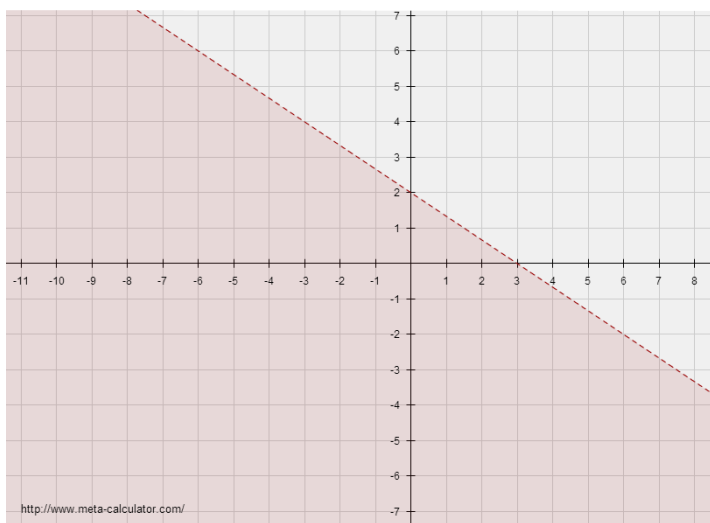
55. 19 and 15

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. $1.67x \cdot 10^{-6}$

63. 3.9×10^5

64. 0.0000002197

65. 1.68×10^{-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. $(2x - 3)(4x^2 - 6x + 9)$

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.

Woodland Community College: Math Practice Test

Intermediate Algebra Math Test

The following problems are recommended practice problems for the intermediate 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 the problems, we suggest that you review those topics before taking the test.

1. Factor completely.

(a) $15x^5 - 12x^4 + 27x^3 - 3x^2$ (b) $16x^2 - 81y^2$ (c) $-4x^2 + 23x - 28$ (d) $4x^2 - 169$ (e) $16x^2 + 25$
(f) $x^2 + 11x + 30$ (g) $2x^2 + 9x - 18$ (h) $125x^3 - 64$ (i) $4x^2 - 4xy - 24y^2$

2. Solve the equations by factoring.

(a) $4x^2 = 25$ (b) $x(x+7) = -12$ (c) $3x^3 - 2x^2 = 8x$ (d) $3x^2 + 8x + 5 = 0$

3. Find the x- intercept of the given quadratic equation.

(a) $y = 11x^2 + 21x - 2$ (b) $y = 6x^2 - 2x - 28$

4. A diver jumps from a diving board that is 324 feet above the water. The height h (in feet) of the diver is modeled by the position equation $h = -16t^2 + 324$. Where t is time measured in seconds. How long will it take for the diver to reach the water?

5. The difference of two numbers is 5. The sum of their square is 125. Find the numbers.

6. The area of a square is 144 square units. Find the length of a side.

7. Find the two consecutive negative integers whose product is 240. Find the numbers.

8. Find the domain of each rational function.

(a) $f(x) = \frac{x-3}{x^2-5x+6}$ (b) $f(x) = \frac{x-1}{x^2-6x}$

9. Perform the indicated operation.

(a) $\frac{x+3}{x^2+2x-8} \cdot \frac{x^2-2x}{x^2+6x+9}$ (b) $\frac{x-2}{x^2+4x-4} \div \frac{2x+1}{x^2-4}$ (c) $\frac{x-3}{x^2-2x-15} - \frac{4-x}{x^2-9x+20}$
(d) $\frac{x+1}{x^2-9} + \frac{x}{3-x}$ (e) $\frac{x-3}{x+1} - \frac{x+2}{x}$

10. Simplify the complex fraction.

(a) $\frac{3 - \frac{2}{x}}{\frac{4}{x^2} - 9}$ (b) $\frac{\frac{3}{x-1} + \frac{4x}{x+1}}{\frac{7}{x-1} - \frac{2}{x+1}}$ (c) $\frac{\frac{3}{x} + \frac{1}{y}}{\frac{9}{x^2} - \frac{1}{y^2}}$ (d) $\frac{5x^{-1} - 2y^{-1}}{25x^{-2} - 4y^{-2}}$

11. Solve the following equations.

(a) $\frac{x}{x-1} = \frac{1}{2} + \frac{3}{x}$ (b) $\frac{3}{x+1} - \frac{1}{x+1} = \frac{14}{x^2-1}$ (c) $\frac{x}{x^2-9} + \frac{4}{4x-12} = \frac{-3}{x}$

12. Solve the equation $T = \frac{5R}{S+U}$ for S.

13. Solve the equation $\frac{1}{x} = \frac{1}{y} + \frac{1}{z}$ for x .

14. Renee walks 4 mi in the same time that Jane jogs 7.2 mi. If Jane jogs 2mph faster than Renee walks, then how fast does Jane jog?

15. The quotient of twice a number and three, minus one-sixth is the quotient of the number and two. What is the number?

16. Smith Engineering is in the process of reviewing the salaries of their surveyors. During this review the company found that an experienced surveyor can survey a roadbed in 6 hours. An apprentice surveyor needs 9 hours to survey the same stretch of road. If the two work together, find how long it takes them to complete the job.

17. A paddle boat can move at a speed of 4km/h in still water. The boat is paddled 14 km downstream in a river in the same time it takes to go 7 km upstream. What is the speed of the river?

18. Solve the equations.

(a) $x^2 + 6x = -3$ (b) $(x - 7)^2 = 36$ (c) $(x - 2)^2 - 16(x - 2) + 63 = 0$ (d) $x^{2/3} - 3x^{1/3} - 10 = 0$
 (e) $x^{-2} - 5x^{-1} + 6 = 0$

19. Solve the equation by completing the square. (a) $x^2 - 12x + 19 = 0$ (b) $4x^2 - 24x + 15 = 0$

20. Solve the quadratic inequality. Graph the solution and write the solution in

21. interval notation.

(a) $3x^2 + 16x < -5$ (b) $\frac{x^2 + 6}{5x} \geq 1$ (c) $\frac{x - 2}{x + 6} \geq 0$ (d) $x^2 + 2x - 8 \leq 0$

22. Graph parabola. Find the vertex and label the axis of symmetry.

(a) $f(x) = 4(x - 2)^2 + 1$ (b) $f(x) = -2x^2 + 3$ (c) $f(x) = x^2 - 4x + 3$

23. A triangle has a height of $x - 8$ and the base of $2x - 8$. Given that the area of the triangle is 32square feet. Find the base and the height of the triangle.

24. If a projectile is fired straight upwards from the ground with the initial speed of 160 feet per second, then its height h in feet after t seconds is given by the equation $h(t) = -16t^2 + 160t$. Find the maximum height of the projectile.

25. A jogger ran 3 miles, decreased her speed by 1 mile per hour, and then ran another 4 miles. If her total time was 1.6 hours, find her speed for each part of her run.

26. Use $A = P(1 + r)^t$ to find the rate r at which \$ 250,000 grows to \$330,625 in 2 years.

27. One number is 8 more than another number, if the product of these numbers is 273. What are the two numbers?

28. Simplify each of the following. Assume all variables represent positive real number.

(a) $7\sqrt[5]{64x^{13}y^{17}}$ (b) $\frac{\sqrt{21x^3y^7}}{\sqrt{3x y}}$ (c) $\frac{\sqrt[5]{64x^{10}y^3}}{\sqrt[5]{2x^3y^{-7}}}$ (d) $\left(\frac{3a^{-1}b^{-2}}{b^3}\right)^3$
 (e) $4\sqrt[4]{192x^8y^{30}z^{25}}$ (f) $(-8)^{-4/3}$ (g) $\frac{3\sqrt[3]{100x^{28}}}{2\sqrt{2x^{-1}}}$ (h) $\frac{\sqrt[4]{96x^{10}y^3}}{\sqrt[4]{3x^2y^3}}$

29. Perform the indicated operation.

$$\begin{array}{lll}
 \text{(a)} \sqrt{10xy^3} \cdot \sqrt{5x^3y} & \text{(b)} (2\sqrt{6} - \sqrt{7})(4\sqrt{6} + 3\sqrt{7}) & \text{(c)} \sqrt{3}(2\sqrt{6} - 5\sqrt{12}) \\
 \text{(d)} 3\sqrt{108} - 2\sqrt{18} - 3\sqrt{48} & \text{(e)} \sqrt[3]{54xy^3} - 5\sqrt[3]{2xy^3} + y\sqrt[3]{128x} & \text{(f)} \sqrt[3]{48xy^3} - 5\sqrt[3]{384xy^3} + y\sqrt[3]{6x} \\
 \text{(g)} \frac{-\sqrt[3]{2x^4}}{9} + \sqrt[3]{\frac{250x^4}{27}} & \text{(h)} \sqrt[4]{50x^2y^3} \cdot \sqrt[4]{25x^3y^2} &
 \end{array}$$

30. Rationalize the denominator in each expression. Assume all variables represent positive real numbers.

$$\text{(a)} \frac{5x}{\sqrt[5]{8x^9y^{11}}} \quad \text{(b)} \frac{3}{\sqrt[3]{2}} \quad \text{(c)} \frac{2}{1 + \sqrt{15}} \quad \text{(d)} \frac{6}{\sqrt{5} - \sqrt{3}} \quad \text{(e)} \frac{\sqrt{5}}{\sqrt{5} + \sqrt{3}}$$

31. Use rational expression to write as a single radical expression. $\sqrt[4]{3} \cdot \sqrt[3]{5}$

32. Solve the following equations. (check your answers).

$$\text{(a)} \sqrt{2x-3} + x = 3 \quad \text{(b)} \sqrt{x-3} + \sqrt{x+2} = 5 \quad \text{(c)} \sqrt{x+3} = \sqrt{x} - 3$$

33. Find the distance between $(-9, 5\sqrt{3})$ and $(-13, 3\sqrt{3})$.

34. Perform the indicated operations write the answer in the form $a + bi$

$$\text{(a)} (3 + 2i) - (6 + i) + (5 + 3i) \quad \text{(b)} \frac{7}{4 + 3i} \quad \text{(c)} \frac{3 + 4i}{2i} \quad \text{(d)} (3 - 4i)^2$$

$$\text{35. Simplify (a)} i^{75} \quad \text{(b)} i^{-18} \quad \text{(c)} i^{79} \quad \text{(d)} \sqrt{-75}$$

36. If $f(x) = x^2 - 6x + 2$ and $g(x) = -2x$ find $(g \circ f)(2)$.

37. Find the inverses of the following functions.

$$\text{(a)} f(x) = \frac{1}{2}x - 7 \quad \text{(b)} f(x) = \frac{1}{3x - 8}$$

38. Graph (a) $f(x) = 2^{x+2}$ (b) $f(x) = 2^x + 1$ (c) $f(x) = \left(\frac{1}{2}\right)^x$

39. Write $\log_{0.4} 0.064 = 3$ as an exponential equation.

40. Write $\pi^3 = x$ as a logarithmic equation.

41. Write as a single logarithm. (a) $2\log_{10} x - 3\log_{10}(x+2) + \log_{10}(x^2 - 2)$ (b) $5\log_5 x + 2\log_5 x - \frac{1}{4}\log_5 x$

$$\text{(c)} 2\log_4 2 + \log_4 10 - 2\log_4 5 \quad \text{(d)} \log_6 x - \log_6(x+5) + \log_6(x^2 + 2)$$

42. Solve each equation for x. (a) $\log(3x-4) = -0.9$ (b) $\ln(2x-1) = 3.4$ (c) $2^{8x-2} = 7$

$$\text{(d)} e^{4x} = 3 \quad \text{(e)} \log_6 x + \log_6(x+16) = 2 \quad \text{(f)} \log_6(x+1) - \log_6 x = 2$$

$$\text{(g)} \ln 5 + \ln x = 0 \quad \text{(h)} \log_x 81 = 4 \quad \text{(i)} \log_{125} x = \frac{1}{3} \quad \text{(j)} \log_{27} 3 = x$$

43. Find how long it would take for \$1800 to double if it is invested at 6% interest compounded monthly.

Use $A = P\left(1 + \frac{r}{n}\right)^{nt}$ and round to nearest tenth.

44. In 2007, Germany had a population of 82,800 thousand. At that time, Germany's population was declining at a rate of 0.035% per year. If this continues, how long will it take Germany's population to reach 82,000 thousand? Use $y = y_0 e^{-0.00035t}$ and round to nearest tenth.
45. Find the elevation of a delta jet of the atmosphere pressure outside the jet is 11.9 lb/in^2 . Use $P = 14.7 e^{-0.21x}$ gives the average atmosphere pressure P in pounds per square inch, at an altitude x, in miles above the sea level. Round the answer to nearest tenth.
46. Graph parabola. Find the vertex. $x = -y^2 - 4y - 6$
47. Find the center and radius of the circle and then graph. $x^2 + y^2 + 2x + 4y - 11 = 0$
48. Graph the equation $4x^2 - 25y^2 = 100$
49. Graph the equation $4x^2 + 9y^2 = 36$
50. Graph the equation $\frac{x^2}{8} + \frac{y^2}{8} = 2$
51. Graph the equation $x = (y + 3)^2 - 1$
52. solve (a) $\begin{cases} x^2 - 2y = 5 \\ x + y = -1 \end{cases}$ (b) $\begin{cases} 5x^2 + 5y^2 = 60 \\ y = \sqrt{x} \end{cases}$ (c) $\begin{cases} x^2 + y^2 = 1 \\ x + y = 4 \end{cases}$ (d) $\begin{cases} x^2 + 3y^2 = 21 \\ x^2 - y^2 = 1 \end{cases}$

Math practice Test answers

1. a. $3x^2(5x^3 - 4x^2 + 9x - 10)$, b. $(4x - 9y)(4x + 9y)$ c. $(4 - x)(4x - 7)$, d. $(2x - 13)(2x + 13)$,
 e. prime, f. $(x + 5)(x + 6)$, g. $(x + 6)(2x - 3)$, h. $(5x - 4)(25x^2 + 20x + 16)$,
 i. $4(x^2 - xy - 6y^2) = 4(x - 3y)(x + 2y)$
2. a. $\pm \frac{5}{2}$, b. $-4, -3$, c. $\frac{-4}{3}, 0, 2$, d. $\frac{-5}{3}, -1$
3. a. $-2, \frac{1}{11}$, b. $-2, \frac{7}{3}$
4. 4.5 sec
5. 5, 10
6. 12
7. -16, -15
8. a. $\{x / x \in \mathbb{R} \text{ and } x \neq 2, 3\}$, b. $\{x / x \in \mathbb{R} \text{ and } x \neq 0, 6\}$

9. a. $\frac{x}{(x+3)(x+4)}$, b. $\frac{(x-2)^2(x+2)}{(2x+1)(x^2+4x-4)}$, c. $\frac{2x}{(x-5)(x+3)}$, d. $\frac{-x^2-2x+1}{(x-3)(x+3)}$
 e. $\frac{-6x-2}{x(x+1)}$

10. a. $\frac{-x}{3x+2}$, b. $\frac{(x+1)(4x+3)}{5x+9}$, c. $\frac{-xy}{x-3y}$, d. $\frac{xy}{2x+5y}$

11. a. 3, 2, b. 8, c. $\frac{-3(\sqrt{61}+1)}{10}$, $\frac{3(\sqrt{61}-1)}{10}$

12. $S = \frac{5R - UT}{T}$

13. $X = \frac{yz}{y+z}$

14. 4.5 mph

15. 1

16. 3.6

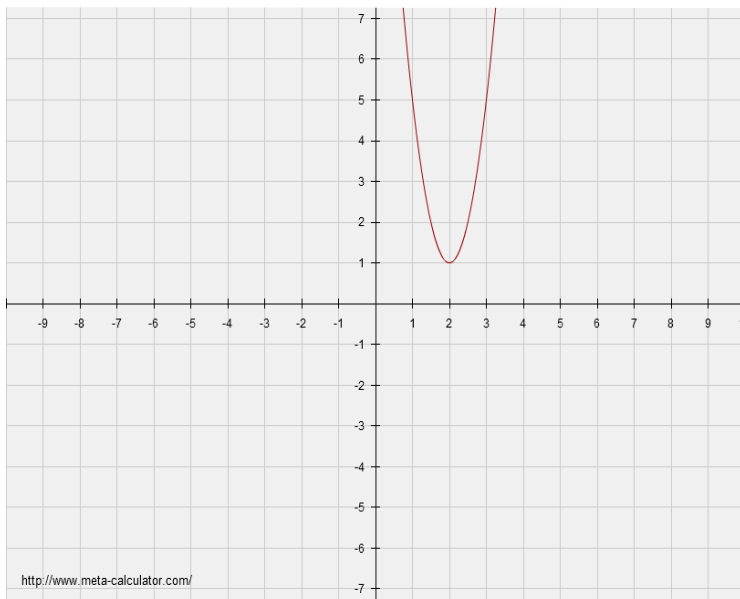
17. 12km/h

18. a. $\pm\sqrt{6}-3$, b. 1, 13, c. 9, 11, d. -8, 125, e. $\frac{1}{3}, \frac{1}{2}$

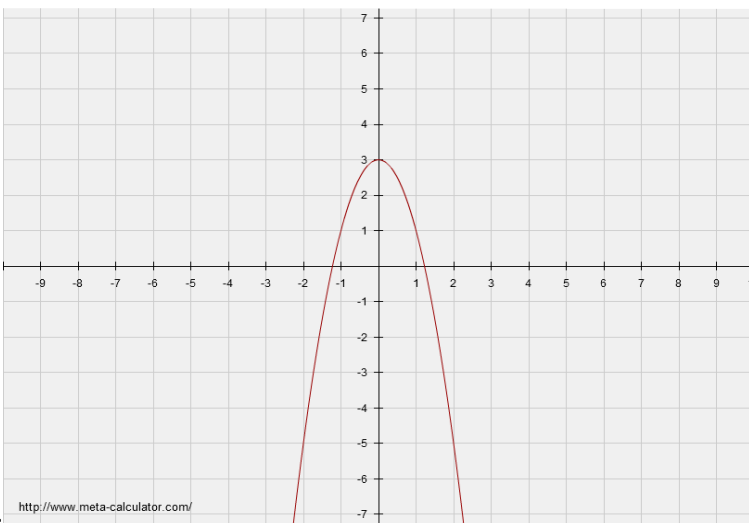
19. a. $\pm\sqrt{17}+6$, b. $\frac{\pm\sqrt{21}+6}{2}$

20. a. $(-5, -\frac{1}{3})$, b. $(0, 2) \cap [3, \infty)$, c. $(-\infty, 6) \cap ([2, \infty)$, d. $[-4, 2]$

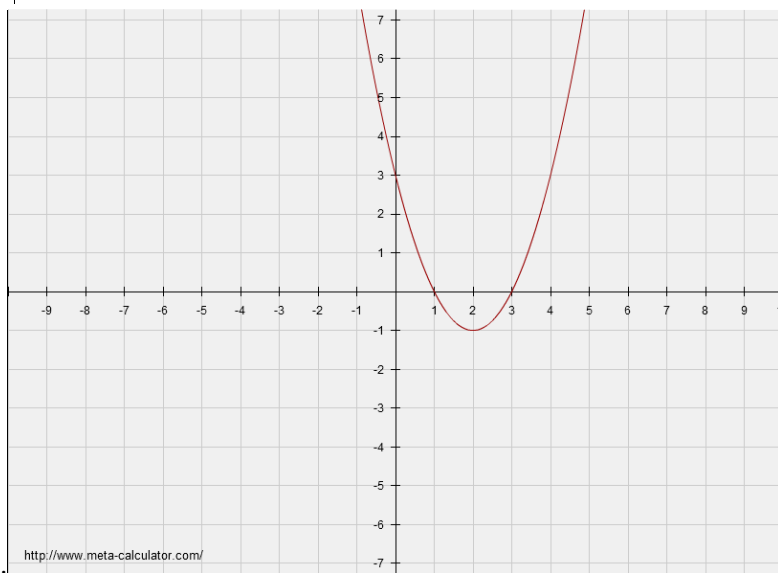
21. a



b.



c.



c.

22. 4,16

23. 400 feet

24. 4, 5

25. 3/20 or 15%

26. -21,-13 or 13,21

27. a. $14x^2y^3\sqrt[5]{2x^3y^2}$, b. $|xy^3|\sqrt{7}$, c. $2xy^3\sqrt[5]{x^2}$, d. $\frac{27}{\sqrt{ab^{11}}}$, e. $2x^2y^7z^6\sqrt{12y^2z}$,

f. $\frac{1}{16}$, g. $\frac{15x^{14}\sqrt{2x}}{2}$, h. $2x^4\sqrt[4]{2x}$

28. a. $5x^2y^2\sqrt{2}$, b. $2\sqrt{42}+27$, c. $6\sqrt{2}-30$, d. $6\sqrt{3}-6\sqrt{2}$, e. $2y\sqrt[3]{2x}$,

f. $-17y\sqrt[3]{6x}$, g. $\frac{4x\cdot\sqrt[3]{2x}}{9}$, h. $5xy\sqrt[4]{2xy}$

29. a. $\frac{5\sqrt[5]{4xy^4}}{2xy^3}$, b. $\frac{3\sqrt[3]{4}}{2}$, c. $\frac{\sqrt{15}-1}{7}$, d. $3\sqrt{5}+3\sqrt{3}$

30. $\sqrt[12]{16875}$

31. a. 2, b. 7, c. no solution

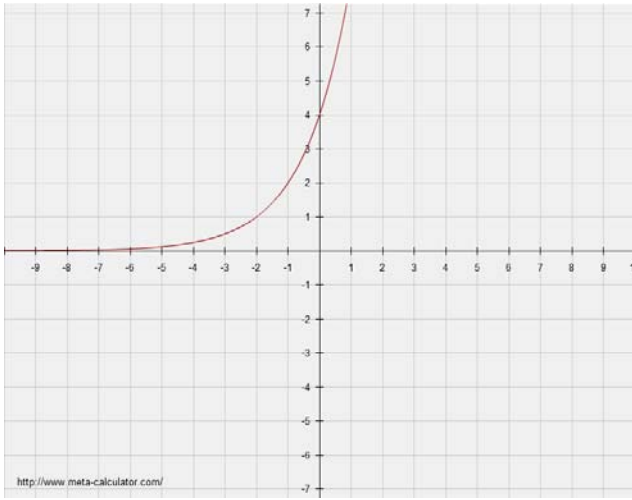
32. $\sqrt{43}$

33. a. $2+4i$, b. $\frac{28+21i}{25}$, c. $4-3i$, d. $-7-24i$

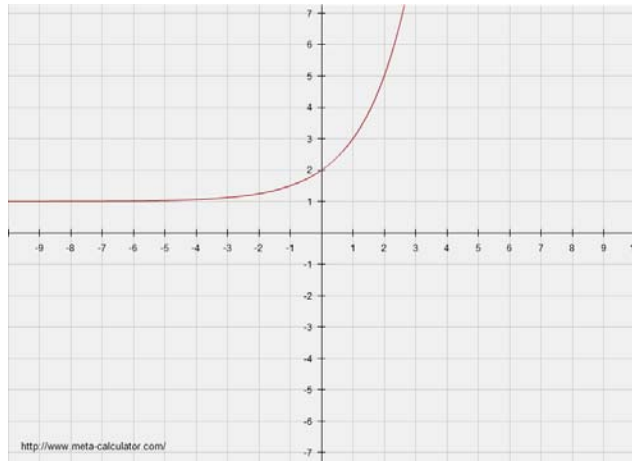
34. a. $-i$, b. -1 , c. $-i$, d. $5i\sqrt{3}$

35. 12

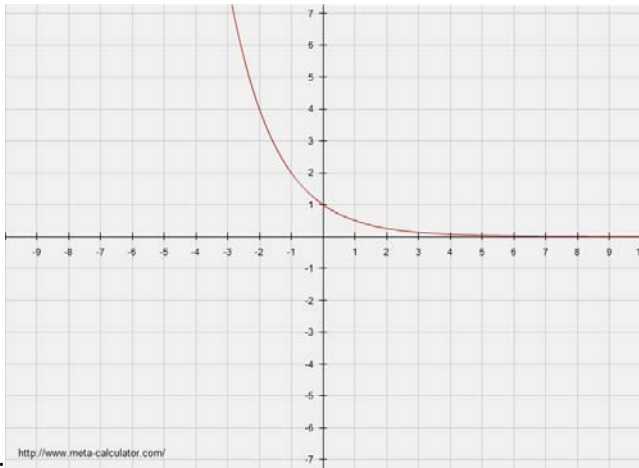
36. a. $f(x)^{-1}=2x+14$, b. $f(x)^{-1}=\frac{8x+1}{3x}$



37. a.



b.



c.

38. $0.4^3 = 0.00064$

39. $\log_{\pi} X = 3$

40. a. $\log_{10} \frac{x^2(x^2 - 2)}{(x + 2)^3},$

b. $\log_5 x^6 \sqrt[4]{x^3},$

c. $\log_4 \frac{8}{5},$

d. $\log_6 \frac{x(x^2 - 2)}{x + 5}$

41. a. $\frac{10^{10} + 40}{30}$,

b. $\frac{e^{3.4} - 1}{2}$ or ≈ 14.4821 ,

c. $\frac{\ln 28}{8 \ln 2}$ or $\approx .60919$

d. $\frac{\ln 3}{4}$ or $\approx .274653$,

e. 2,

f. $\frac{1}{35}$,

g. $\frac{1}{5}$,

h. 3,

i. 5,

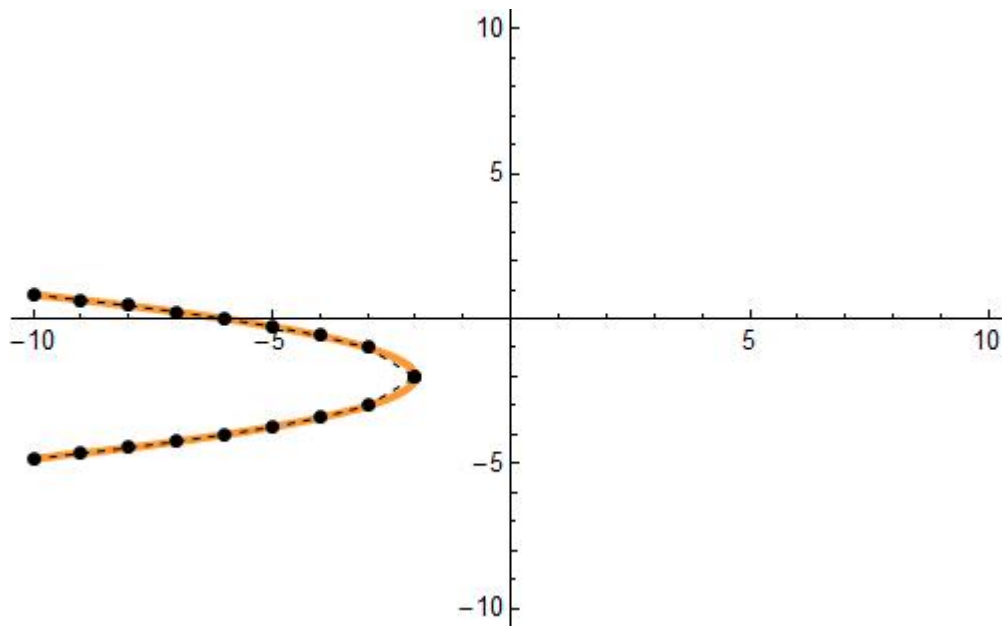
j. $\frac{1}{3}$

42. 11.58

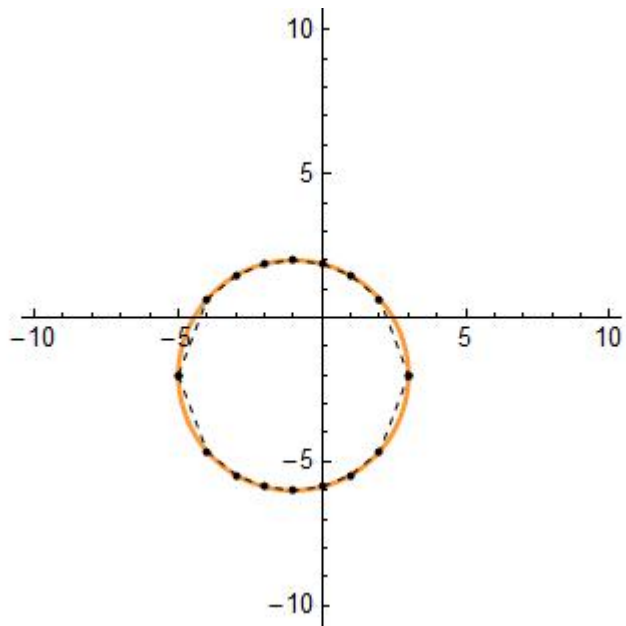
43. 27.7

44. 1.0

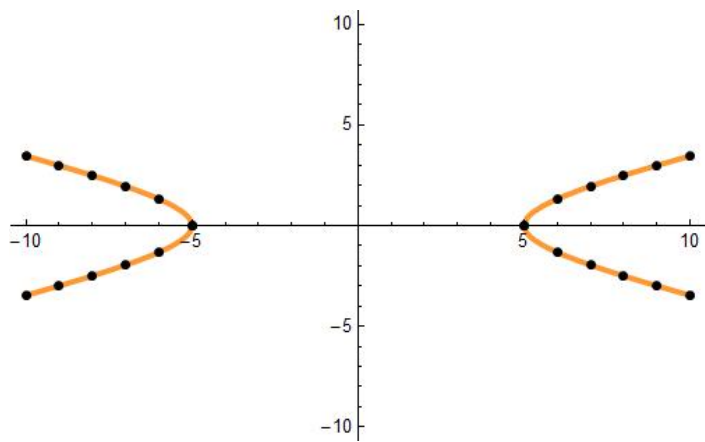
45. Vertex (-2,-2)



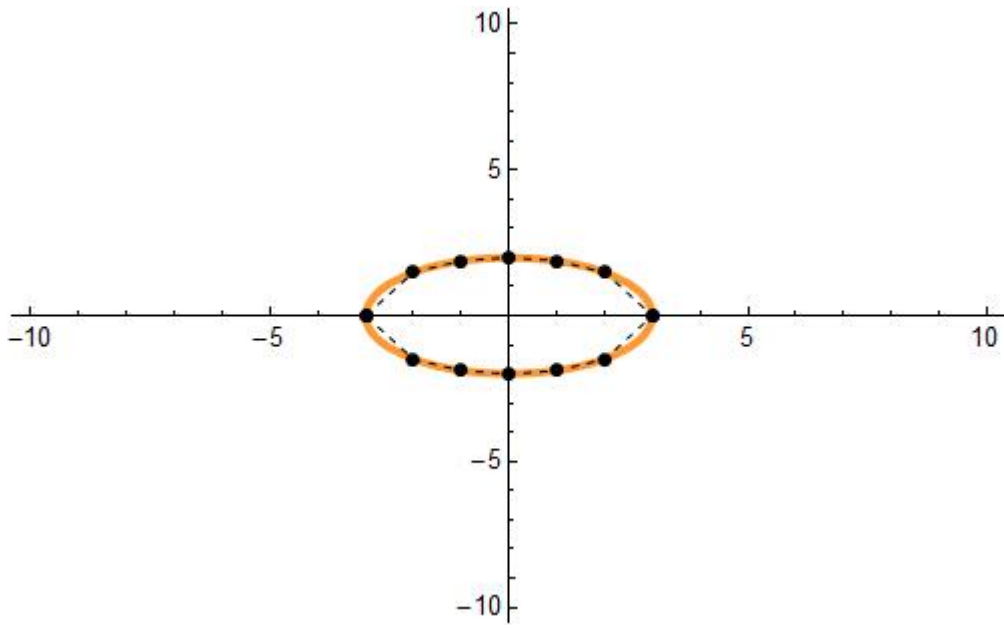
46. $r=4$ C (-1,-2)



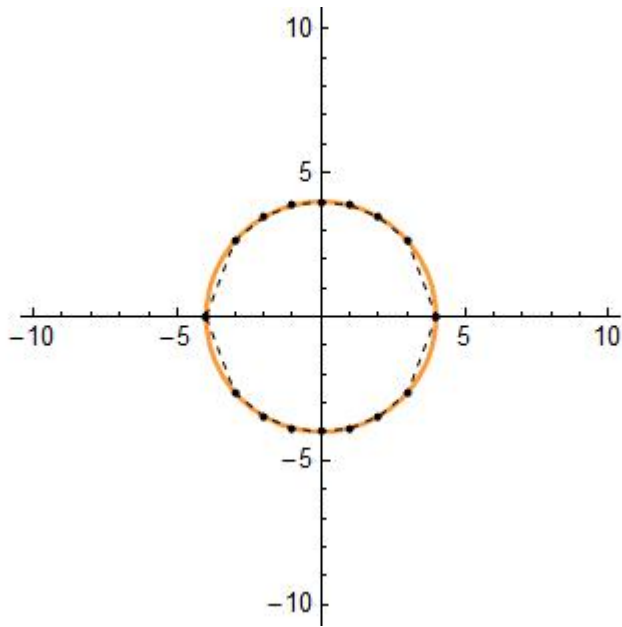
47.



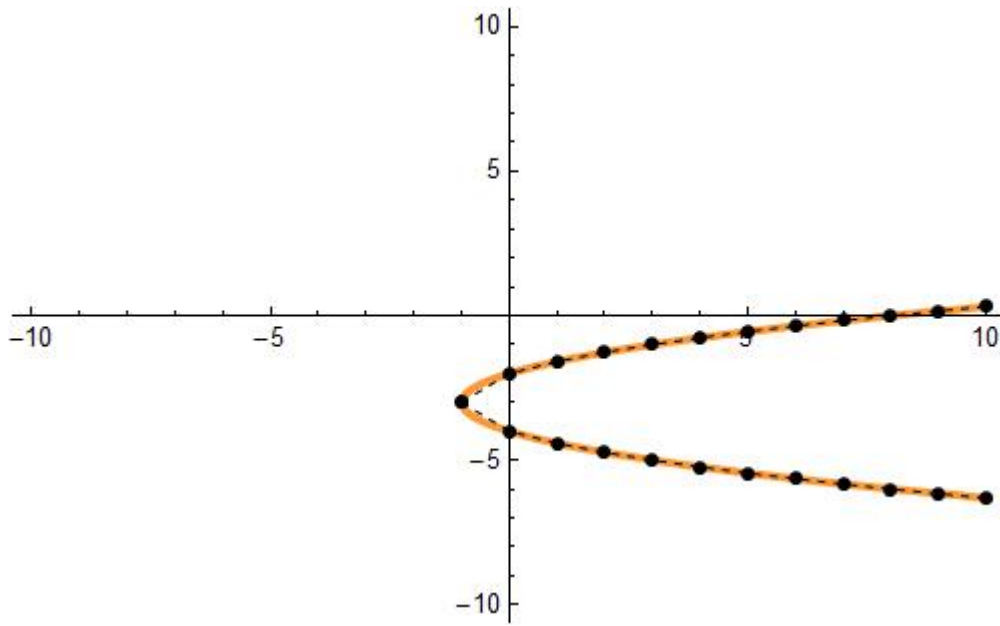
48.



49.



50.



51. a. $(-3,2)$ or $(1,-2)$ b. $(3, \sqrt{3})$, c. no solution,
 d. $(-\sqrt{6}, -\sqrt{5})$ or $(-\sqrt{6}, \sqrt{5})$ or $(\sqrt{6}, -\sqrt{5})$ or $(\sqrt{6}, \sqrt{5})$