

Taking the Computerized Compass Math Placement Test

The computerized Compass Math Placement Test starts out in Algebra and keeps progressing higher and higher through algebra until you can no longer answer questions at a certain level consistently.

Only when you consistently answer questions at a certain level, will the test end, and then your level of placement will be assessed. If you do not answer questions in the algebra section correctly, that is, consistently get them wrong, the test will branch to the lower level of basic math and begin testing in basic math. Do not fear if you are getting none of the algebra questions correct. You will soon be tested on questions in basic math.

If you do have some success on the algebra test, the test will find your consistent level and determine your placement into beginning, intermediate or college algebra, even potentially trigonometry or calculus. If you score high percentages in all the levels preceding those courses, you will **NOT be tested in basic math**, unless you consistently **miss questions** in the first test of the algebra-computerized test.

So be very careful. Do your best at the beginning of the exam. Once the test drops to the basic math level, it will stay there and not return to algebra. Thus, you will have to do well in the basic math level test to even place into beginning algebra.

If you do poorly in the basic math level test, then you will most likely be placed into a basic math course.

If you hope to place into intermediate algebra or higher, then you have to do very well in the basic algebra test and be careful when doing your work to answer the questions you know how to do and not make any careless mistakes. You will **not** have a chance to go back to those questions or that level of questions if the test drops you below it.

When doing a problem, calculate your answer, check that the computer answer matches your answer, and enter the letter of that choice and press ENTER on the computer keyboard. The computer will ask, "Are you sure of your choice?" You can always change it or double-check it then. But once you have decided and you enter the answer by pressing the ENTER key the second time, it is entered and can not be changed. You can not go back and change the answer.

Compass is a computerized adaptive test. The Compass math test starts in beginning algebra and advances you into higher math levels or lower math levels depending on how you answer the questions.

Forgotten Algebra – A Self-Teaching Refresher Course, 2nd Edition, by Bleau can be purchased at the ECC bookstore for approximately \$12.95.

Web sites: www.library.elgin.edu Go to the Research Guides, then go to Math and then Math Websites for extra help. www.elgin.edu/testing and look for the helpful hints on placement. www.math.com has many helpful math examples. Other sites are www.onlinecollegeprep.com and look for the Arithmetic link, or www.answers.com.

1. $-2 - 4 + 6 - 5(-8 + 3) + 12 = ?$
 - a. 25
 - b. 0
 - c. 67
 - d. 37
 - e. 45

2. $a = 5$ more than the product of 3 and b . What equation best describes this?
 - a. $a = 15 + b$
 - b. $a = 3b + 5$
 - c. $a = 5(3 + b)$
 - d. $a = 15b$
 - e. $a = b$

3. The length of a rectangle is 5 units longer than its width. Which of the following represents its area in square units?
 - a. $5x$
 - b. $x(5 - x)$
 - c. $x(x - 5)$
 - d. $x(x + 5)$
 - e. $2x + 2(x + 5)$

4. The sum of two numbers is 14. If x represents one number, which expression represents the product of the numbers.
 - a. $14x$
 - b. $x(14 - x)$
 - c. $x(14 + x)$
 - d. $(14 - x)(14 + x)$
 - e. $(x + 14)(x - 14)$

5. The sum of two angles is 90° . If the larger angle is twice the measure of the smaller, what is the larger?
 - a. 30°
 - b. 60°
 - c. 45°
 - d. 90°
 - e. 180°

6. What is the slope of the line containing the points (5,7) and (8,11)?

- a. $4/3$
- b. $-4/3$
- c. $18/13$
- d. 0
- e. 1

7. What is the slope of the line determined by the equation $3x - 2y = 12$?

- a. 3
- b. -2
- c. 12
- d. -12
- e. $3/2$

8. What is the distance between points P(-4, -2) and Q(2,1)?

- a. 12
- b. 25
- c. 45
- d. $3\sqrt{5}$
- e. 0

9. What is $\sqrt[3]{250x^3y^7}$

- a. $5x\sqrt[3]{10y}$
- b. $5xy^2\sqrt[3]{2y}$
- c. $2\sqrt[3]{5xy}$
- d. $5xy^3\sqrt{10xy}$
- e. $5\sqrt{10xy}$

10. If for all x not equal to -1, $\frac{3x^2 + kx + 7}{x + 1} = 3x + 7$, then k = ?

- a. 3
- b. 7
- c. 10
- d. 1
- e. 21

11. For all x , $(8x^2 + 5x - 9) - (3x^2 - 5x + 1) = ?$

- a. $5x^2 - 8$
- b. $5x^2 + 10x$
- c. $5x^2 + 10x - 8$
- d. $5(x^2 + 2x - 2)$
- e. $11x^2 - 8$

12. For all k, m, n $\frac{m^5 n^3}{k^2} \div \frac{m^4 n^5}{k^3} = ?$

- a. $\frac{m^9 n^8}{k^5}$
- b. kmn
- c. $\frac{km}{n^2}$
- d. kmn^2
- e. $kmrt$

13. $\frac{(5x^2 y^{-3})^2}{xy} = ?$

- a. $5x^3 y^5$
- b. $\frac{25x^3}{y^7}$
- c. $25x^3 y^5$
- d. $25x^3 y^8$
- e. $\frac{5x^3}{y^7}$

14. For all x not equal to 2, $(x - 2)^2 (x - 2)^{-2} = ?$

- a. 0
- b. 1
- c. $x^2 - 4x + 4$
- d. $x^4 - 4$
- e. $x^4 - 8x^3 + 24x^2 - 32x + 16$

15. What are the solutions of $x^2 - 9x + 18 = 0$?
- 6, -3
 - 6, -3
 - 6, 3
 - 2, 5
 - 0
16. If $x = 2$, what is the value of the expression $(3\sqrt{x})^2$?
- 36
 - 18
 - 12
 - 6
 - 24
17. If $f(x) = x^2 + 4$ and $g(x) = 3 - x$, then $f(g(3)) = ?$
- 0
 - 4
 - 13
 - 10
 - 3
18. If $f(x) = x^2 - 3x - 10$ and $g(x) = 2x - 1$, then $g(f(5)) = ?$
- 1
 - 44
 - 5
 - 9
 - 0
19. If $\sqrt{-1} = i$, what is $(2 - 8i)(8 + 2i)$?
- $16 - 16i$
 - $32 - 60i$
 - $-60i$
 - 60
 - 2

20. If $f(x) = (x-3)^2$ and $g(x) = 3(x-1)^2$, what is $\frac{f(5)}{g(-2)}$?

- a. $\frac{4}{3}$
- b. 0
- c. $\frac{4}{27}$
- d. $-\frac{4}{27}$
- e. $-\frac{5}{2}$

21. If $f\left(\begin{bmatrix} a & b \\ c & d \end{bmatrix}\right) = ad - bc$, then $f\left(\begin{bmatrix} -3 & -5 \\ 4 & 2 \end{bmatrix}\right) = ?$

- a. 14
- b. -14
- c. -26
- d. -2
- e. 7

22. Professor Diamond just received a raise of 5%. If his **new** salary is \$42,000, what was he making before the increase?

- a. \$44,000
- b. \$40,000
- c. \$39,900
- d. \$40,500
- e. \$41,800

23. Mr. Manilow makes a 10% profit on a \$400 investment.
Mr. Floyd makes an 8% profit on a \$500 investment?
Mr. Tull makes a 6% profit on a \$700 investment.
Who made the most money?

- a. Mr. Manilow
- b. Mr. Floyd
- c. Mr. Tull
- d. Mr. Manilow and Mr. Floyd
- e. Mr. Taxman

24. What is the arithmetic mean of the following numbers: 2, 5, 7, 9?

- a. 11
- b. 23
- c. 6
- d. 5.75
- e. $\sqrt{23}$

25. $.7 - .003 = ?$

- a. .4
- b. .703
- c. .021
- d. .007
- e. .697

Answer Key

- 1. d
- 2. b
- 3. d
- 4. b
- 5. b
- 6. a
- 7. e
- 8. d
- 9. b
- 10. c
- 11. d
- 12. c
- 13. b
- 14. b
- 15. c
- 16. b
- 17. b
- 18. a
- 19. b
- 20. c
- 21. a
- 22. b
- 23. c
- 24. d
- 25. e

FORMULAS

Slope of the line with points (X_1, Y_1) and (X_2, Y_2)

$$M = \frac{Y_2 - Y_1}{X_2 - X_1}$$

Equation of the line with slope M and a given point (X_1, Y_1)

$$Y - Y_1 = M(X - X_1)$$

Equation of line in slope-intercept form:

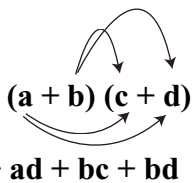
M = slope, B = Y intercept. (Value of Y when X is 0)

$$Y = MX + B$$

Quadratic Formula to solve $ax^2 + bx + c = 0$

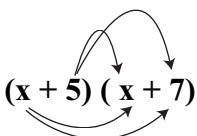
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

FOIL Product for $(a + b)(c + d)$

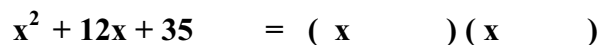


$ac + ad + bc + bd$

So for $(x + 5)(x + 7) = x^2 + 7x + 5x + 35 = x^2 + 12x + 35$



To factor a FOIL product quantity, "UN" FOIL it.

$$x^2 + 12x + 35 = (x \quad)(x \quad)$$


Find two numbers whose sum is 12 and whose product is 35.

$35 = 35 \times 1$ or 7×5 and $7 + 5 = 12$ so use 7 and 5

$x^2 + 12x + 35 = (x + 7)(x + 5)$ Factored form

FORMULAS**Factoring example:**

$$x^2 + 14x + 48 = (x + 8)(x + 6)$$

$$\begin{array}{r}
 48 = 48 \times 1 \\
 \quad 24 \times 2 \\
 \quad 12 \times 4 \\
 \quad 8 \times 6
 \end{array}
 \begin{array}{l}
 \nearrow \\
 \nearrow
 \end{array}
 \text{ (Use 8 and 6 because } 8 + 6 = 14 \text{)}$$

Absolute Value:

$$|x + 3| < 4 \text{ means}$$

$$x + 3 < 4 \quad \text{and} \quad x + 3 > -4$$

$$\begin{array}{r}
 x + 3 < 4 \\
 -3 \quad -3 \\
 \hline
 x < 1
 \end{array}
 \quad \text{and} \quad
 \begin{array}{r}
 x + 3 > -4 \\
 -3 \quad -3 \\
 \hline
 x > -7
 \end{array}$$

$$-7 < x < 1$$

Distance Formula

Distance between the two points (X_1, Y_1) and (X_2, Y_2)

$$D = \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2}$$

Example: Find the distance between points $(1,3)$ and $(4,7)$

$$D = \sqrt{(4 - 1)^2 + (7 - 3)^2} = 5$$

Composite Functions:

If $f(x) = x^2$ and $g(x) = 3x + 2$,

$$f \circ g(x) \text{ or } f(g(x)) = f(3x + 2) = (3x + 2)^2$$

$$\text{so } f(g(2)) = f(3(2) + 2) = f(8) = 8^2 = 64$$

$$g \circ f(x) \text{ or } g(f(x)) = g(x^2) = 3(x^2) + 2$$

$$\text{so } g(f(2)) = g(2^2) = g(4) = 3(4) + 2 = 14$$

ADDING FRACTIONS

When fractions have a **common denominator**, it means they have the **same name**, and thus can be added (or subtracted) like other things that have the same name. Three (3) dimes plus four (4) dimes are seven (7) dimes. However, three (3) dimes plus four (4) quarters can not be added unless each is converted to equivalent values with a common name. Therefore, equivalent fractions with a common denominator are needed:

$$3 \text{ dimes} = \frac{3}{10} \quad 4 \text{ dimes} = \frac{4}{10}$$

$$3 \text{ dimes} + 4 \text{ dimes} = 7 \text{ dimes} \quad \frac{3}{10} + \frac{4}{10} = \frac{7}{10}$$

The numerators (numbers) are added and the denominators (name of the fractions) stay the same.

$$3 \text{ dimes} = \frac{3}{10} \quad 4 \text{ quarters} = \frac{4}{4}$$

Three (3) dimes plus four (4) quarters = ?

$$\frac{3}{10} + \frac{4}{4} = ?$$

A common denominator of dimes and quarters would be nickels since each can divide evenly into nickels.

1 Quarter = 5 nickels
 Therefore 4 quarters = 20 nickels
 1 nickel = 1/20 (of a dollar)
 4 Quarters = 20/20 (of a dollar)


$$1 \text{ dime} = 2 \text{ nickels}$$

$$1 \text{ nickel} = \frac{1}{20} \text{ of a dollar}$$

$$\text{Therefore, } 1 \text{ dime} = \frac{1}{10} = 2 \text{ nickels} = \frac{2}{20} \text{ of a dollar}$$

$$\frac{3}{10} = 3 \text{ dimes} = 6 \text{ nickels} = \frac{6}{20}, \dots, \frac{4}{4} = 4 \text{ quarters} = 20 \text{ nickels} = \frac{20}{20}$$

Common denominator for dimes 1/10 and quarters 1/4 is nickels 1/20

Adding Unlike Fractions	
1. Change Fractions to equivalent fractions with common denominator	1. $\frac{3}{10} + \frac{4}{4}$ 
2. Multiply numerator and denominator by the number necessary to get the common denominator which is a multiple of both original denominators Lowest common multiple of 4 and 10 is 20 because 20 divides exactly by 4 and 10 with no remainder.	2. $\frac{3}{10} \cdot \frac{2}{2} + \frac{4}{4} \cdot \frac{5}{5}$
3. Now add the numerators of the new fractions, keeping the denominator the same.	3. $\frac{6}{20} + \frac{20}{20} = \frac{26}{20}$
4. Reduce – divide out the common factors.	4. $\frac{26}{20} = \frac{13 \cdot \cancel{2}}{10 \cdot \cancel{2}} = \frac{13}{10} = 1 \frac{3}{10}$

As expected, 3 dimes, plus 4 quarters equal \$1.30.

This is the equivalent of 26/20 or 26 nickels

Or 13/10 or 13 dimes or

One whole dollar and 3 dimes or 30 cents $1 \frac{3}{10} = 1 \frac{30}{100} = \$ 1.30$.