

Review of Math 80

The student will be able to...

1. Complete operations with fractions (Addition, subtraction, multiplication, division), including understanding when common denominators are needed, how to find common denominators, and how to simplify fractions using factoring and reducing common factors.
2. Solve linear equations in one variable. Understand the difference between contradictions, identities, and conditional equations.
3. Factor binomials using difference of squares, trinomials using any working algorithm or procedure, and polynomials by using grouping. Factoring a common term from an expression and factoring trinomials with leading coefficients which are not 1.
4. Solve quadratic equations in one variable using factoring and quadratic formula. Be able to show that a value is or is not a solution to an equation using substitution.
5. Solve systems of equations in two variables using substitution, graphing, and/or elimination. Understand the difference between contradiction (inconsistent – parallel lines – no solution), dependent, and independent (intersecting lines) systems of equations.
6. Graph points on the rectangular (Cartesian) coordinate system. Graph lines on the rectangular system. Understand concepts such as intercepts, points of intersection, and slope. Be able to interpret what the slope means as a rate of change.
7. Find equations of lines through two points, one point given the slope. Understand slope intercept form of a line (point-slope form is possible as well, though not as often used), what each variable means, and how to use each piece to graph lines quickly.
8. Setup and solving of typical word problems (distance/rate/time, percentage of mixture, percentages with interest, coin problems, etc.) including identifying the variable, creating mathematical equations from the English sentences, solving the equations, and answering the question in complete sentences.
9. Be able to multiply, add and subtract with polynomials, understanding the concept of like terms with decimals, fractions, and whole numbers.
10. Understand roots (Square roots only) to the extent that the Pythagorean theorem may be utilized in different contexts, including but not limited to: length of a diagonal of a rectangle, length of a line segment in a right triangle, etc.

Sample Test of Math 80 Concepts

(note: This test corresponds directly to the list of core Math 80 topics)

1. Evaluate and simplify the result:

a) $\frac{2}{3} + \frac{3}{4}$ b) $\frac{2}{3} - \frac{3}{5}$ c) $\frac{2}{3} \cdot \frac{3}{7}$ d) $1\frac{2}{3} \div 2\frac{3}{4}$

Reduce to lowest terms:

e) $\frac{26}{80}$ f) $\frac{84}{91}$

2. Solve: a) $3x - 7 = 12$ b) $6x + 3 = 2(3x - 7)$

c) $4(x + 1) = 2(2x + 2)$ d) $\frac{2}{7}(x + 9) = 19$

3. Factor: a) $a^2 - 9b^2$ b) $x^2 - 12x + 35$

c) $2x^2 - 4xy - 10hx + 20hy$ d) $10x^2 - 30y^2$

e) $2x^2 + 5x - 12$

4. Solve: a) $x^2 - 12x + 35 = 0$ b) $x(x + 2) = 5$

Show that the following are, or are not solutions to the equation $x^2 - 12x + 35 = 63$:

c) $x = 5$ d) $x = -2$

5. Find the solution(s) to the systems using the appropriate method:

a) $\begin{cases} 2x + y = 3 \\ 4x - 7y = 2 \end{cases}$ (use elimination) b) $\begin{cases} 3x - y = 2 \\ 2x + y = 8 \end{cases}$ (use substitution)

c) $\begin{cases} x + y = 3 \\ y = x - 4 \end{cases}$ (use graphing) d) $\begin{cases} 3x + 4y = 12 \\ y = -\frac{3}{4}x + 3 \end{cases}$ (your choice)

e) $\begin{cases} 4x + 3y = 7 \\ 4x - 8 = -3y \end{cases}$ (your choice)

6. a) Graph the points on the Cartesian (rectangular) coordinate system:

$K = (2,3)$, $L = (-4,-2)$, $M = (-1,3)$, $N = (1,-2)$, $P = (0,4)$, $Q = (-3,0)$

b) Graph the two lines $y = 2x + 4$ and $2x + 3y = 6$ on the same coordinate system by plotting the intercepts.

c) What is the slope of each line in part *b* of question 6?

d) What is the slope of the line between *K* and *L* (use the points from part *a* of question 6)?

What is the slope of the line between *M* and *N* (use the points from part *a* of question 6)?

e) A line has a slope of $-\frac{4}{5}$. What does this mean?

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7. Find an equation of a line with the following properties:

- a) passes through (2,3) and (4,7).
- b) passes through (4,7) with slope of -3 .
- c) In the equation $y = mx + b$, what do each of the variables represent?
- d) How can you use the equation $y = 2x + 4$ to graph a line quickly, without using a table of values?

- 8.
- a) How much of a 20% solution must be mixed with a 50% solution to make 10 liters of a 30% solution?
 - b) Ian has 30 coins, some are dimes and some are nickels. If Ian has a total of \$2.50, how many dimes and how many nickels does he have?
 - c) Bill can ride 10 km in the same time that Jill can ride 15 km. If Jill rides 10 kph faster than Bill, how fast does Bill ride?
 - d) Mr. Hiyamoto has \$8000 to invest. He invests part of the money at 6% and the rest at 7%. If his interest for one year is \$510, how much does he have invested at each rate?
 - e) A cork and a bottle cost \$1.10. The cork costs one dollar less than the bottle. How much does each cost? If you buy 15 corks and 13 bottles, how much do you spend?
 - f) The sum of two numbers is 14. If twice the smaller number is 2 less than the larger, find the two numbers.

9. Complete the following operations with polynomials:

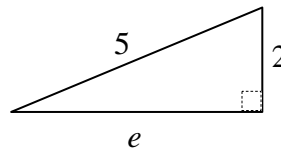
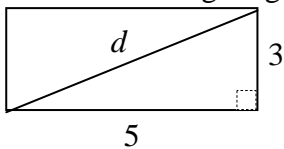
a) $(2x^2 + 3x) + (5x^3 + 7x^2 - 31x + 4)$

b) $(3x^2 - 7x + 4) - (2x^2 - 0.81x + 9)$

c) $\left(\frac{3}{4}y - 7\right)\left(4y^2 + \frac{5}{7}y\right)$

10. Simplify: a) $\sqrt{25}$ b) $\sqrt{36}$ c) $\sqrt{125}$

Find the missing length.



- f) The hypotenuse of a right triangle is 17 inches. One of the legs is 7 inches more than the other. Find the lengths of the two legs.