ALGEBRA PROBLEM SESSION # 1 SOLUTIONS

Introduction to Algebra

Two terms are like terms if they have the same variable part.
To simplify an expression means to combine all like terms.

Graphing Linear Equations

1. True
2. False
3. (a)

x	y
2	1
1	-2
0	-3
-1	-2
-2	1

(b)

x	y
2	-2
1	-3
0	-4
-1	-3
-2	-2

(c)

x	y
2	2
1	-1
0	-4
-1	-7
-2	-10

(d)

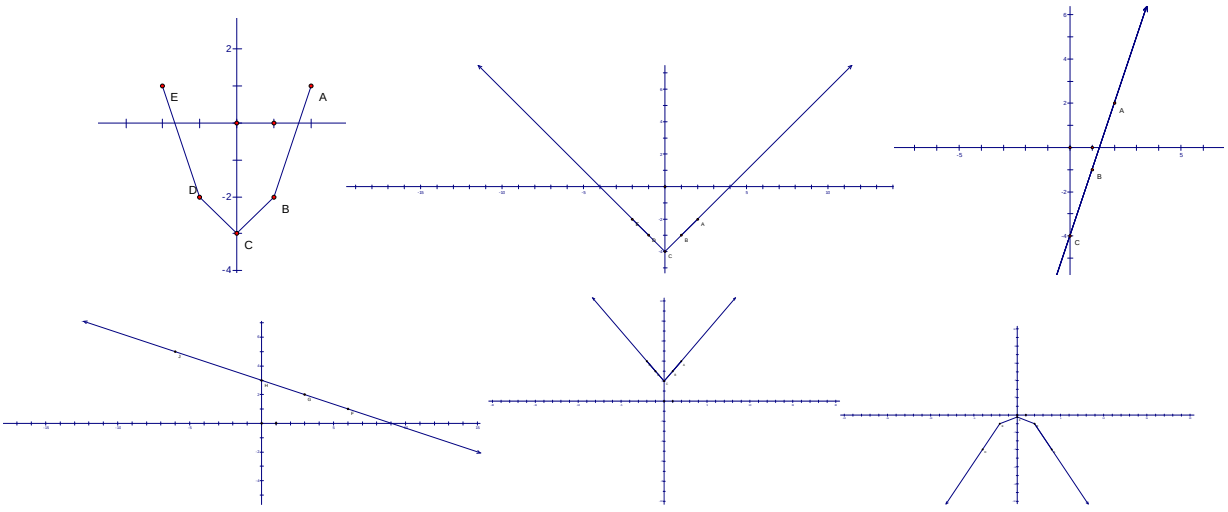
x	y
6	1
3	2
0	3
-4	4
-6	5

(e)

x	y
2	4
1	3
0	2
-1	3
-2	4

(f)

x	y
4	-4
2	-1
0	-1/4
-2	-1
-4	-4



Solving Equations

1. We can remove fractions from an equation, "clear" an equation of fractions, by multiplying both sides of the equation by the least common multiple of the denominators (LCD) of any fractions in the equation.
2. A conditional equation is true for at least one real number and an inconsistent equation is not true for even one real number.
3. 2y = 6 and y + 2 = 5 are equivalent to y = 3.
4. The equation |x| + 5 = 0 has no solution, since it is equivalent to the equation |x| = -5 which has no solution because the function f(x) = |x| is always positive.
5. (a) $x = \frac{5}{3}$ (b) $x = -6$ (c) $x = 33$ (d) $x = -20$
   (e) $x = 1$ (f) $x = \frac{17}{4}$ (g) $x = \frac{31}{15}$
6. $x = 1$
7. $x = 40$
8. $x = \frac{-1}{5}$
9. $x = 1\frac{5}{6}$
10. $m = -\frac{1}{20}$

Solving Simple Verbal Problems

1. Sale price = $55.25
2. Regular price = $64
3. Not contaminated = 850 pounds
4. Selling price = $345
5. Discount rate = 20%
6. Discount rate = 7%
7. Votes cast = 180
8. Item on the test = 50
9. Regular price = $80
10. Integer = 46
11. Largest angle = 73 degrees
12. Length = 12 feet; Width = 21 feet
13. Quarters = 9
14. Shorter = 5 feet
15. Number = 10
16. Integers = -1, 0, 1
17. People = 75
18. Miles = 23
19. Number = 3
20. $B = \frac{A}{CH}$
21. $M = \frac{P}{C} - 1$
22. $s = \frac{PD}{2t}$
23. $d = \frac{ca+12c}{a}$

Simplifying Algebraic Expressions

1. $\frac{1}{r^{30}t^5v^5}$
2. $\frac{1}{64n^6y^9}$
3. $4x^{10}y^6$
4. $-\frac{1}{3r^6t}$
5. $\frac{x^{10}}{32y^{15}}$
6. $\frac{3}{8}xy^7$
7. $\frac{1}{16a^6b^4}$
8. $\frac{1}{2xy^9}$
9. $\frac{b^2}{9a^2}$
10. $\frac{y^3r^3s^3t^3}{x^6z^{12}}$
11. $\frac{y}{16x^4}$
12. $\frac{1}{25x^2y^4}$
13. $\frac{b^3}{8a^9}$
14. $\frac{s^4n^2p^2}{m^6r^6t^2}$
15. $\frac{9m^2z^2}{4r^4t^2n^{10}}$
16. $\frac{49y^{14}z^{12}}{25n^8}$

Scientific Notation

1. A number is written in scientific notation if it is of the form $Ax10^n$ where $1 \leq [A]$ and n is an integer.
2. 238,700,000
3. 0.0041
4. 9.92×10^{-23}
5. 704.2
6. 0.02
7. 2×10^{-34}