Self review material for: Linear Equations.

Self Review Materials

Linear Equations

Highline Community College

What is a linear equation:

In algebra, a linear equation is any equation that can be **manipulated** into the form ax + b = c where “a” “b” and “c” are numbers.

It is not always obvious that and equation is linear. Recognizing such equations is one of the skills you will need. Caution: *you are forbidden to divide by zero* (a fact often ignored when talking on other topics). e. g. dividing by (x + 1) is not valid if x = -1. So you must test for x = -1 separately.

Samples of Linear Equations:

$5x+2=12$ solve for x

$l=\frac{gp^2}{4\pi^2}$ solve for g

$\frac{1}{3}q=10$ solve for q

$S=\frac{n}{2}(A+L)$ solve for L

Sample solution:

5(2z – 1) + 7 = 7z – 4(z + 3)
10z –5 + 7 = 7z –4z - 12
10z + 2 = 3z -12
7z + 2 = -12
7z = -14
z = -2

Check: 5 (2(-2) – 1) + 7 = 7(-2) – 4((-2) + 3)
5(-4-1) + 7 = -14 –4(+1)
5 (-5) +7 = -14 –4
-25 +7 = -18
-18 = -18

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Resources for review:

Print: Any basic **algebra** textbook will have material on linear equations. Look in the table of contents and the index for an entry "equations – linear" or "linear equations" sometimes "first degree equations." Usually the first discussion of equations concerns linear equations.
Angel, Alan, Elementary Algebra, Chapter 02 (Library call number 512 A581e)
Tobey/Slater, Beginning Algebra, Chapter 02 (Library call number 512 T628b)

Video: There are several video presentations available in the Highline Community College library media center on the 6th floor. Read a textbook first, then look at the video.
CD Lecture for Tobey/Slater Beginning Algebra, Disc 3, entries 2.1, 2,2, 2.3 library call number 512.9/B417/2002b. The end of Disc 3, track 2.3 is an excellent summary of steps to solving a linear equation.
Angel, Alan, Video tapes to accompany Elementary Algebra for College Students tape number 02, Library call number 512.9 DC21

Special thanks to Helen Burn and Brian Jenks for preparing these materials.

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Practice Problems:

Exercises for review:

1. $-3 = w - 8$ solve for w
2. $2.724 = 9.222 - r$ solve for r
3. $5(m-3) = 30$ solve for m
5. $1-[1-(1-T)] = [T-(T-1)]$ solve for T
7. $7 - 2x = -(3x-2) + 2(x-5)$ solve for x
8. $-2(t-5) - 1 = 5t + 7(1+t)$ solve for t
10. $\frac{2}{3} = \frac{x-2}{15}$ solve for x
12. $\frac{7}{12} - \frac{2}{3} = h - \frac{4}{5}$ solve for h
14. $\frac{5y}{6} - \frac{7y}{15} = 1 + \frac{3y}{10}$ solve for y
16. $a - \frac{10}{3} = \frac{a-10}{3}$ solve for a
18. $H = kt - \frac{gt^2}{2}$ solve for k
20. $H = kt - \frac{gt^2}{2}$ solve for g

Linear equations in disguise.
Hints relate to at least one equation.

Hint 1: Division by zero is not allowed

4. $\frac{1}{x} - \frac{2}{x} = 3$ solve for x
6. $\frac{1}{m} + w = \frac{c}{m}$ solve for m

Hint 2: You may find it useful to square both sides to get rid of radical

9. $\sqrt{6z} = 2$ solve for z
11. $\frac{3}{y} - \frac{5}{y-1} = \frac{3-2y}{y^2-1}$ solve for y
13. $m = \frac{2xy}{x+y}$ solve for x
15. $2\sqrt{b} = \sqrt{3b+4}$ solve for b
17. $\sqrt[3]{3x+4} = 3$ solve for x
19. $\sqrt{w} + \sqrt{w+3} = 3$ solve for w