

FORMATTING: This is semi-formal writing, here. That means show some professionalism. You don't have to type it out, but you do need to be very clear. For the formatting guidelines, please see Writing Project #1.

Online Students: Bring your Writing Project with you to the testing center, and turn it in before you take the test. Don't let 'em staple your project to your test. Early Birds may mail the Writing Project to my mailing address, given in the syllabus.

Main Resources: [Chapter 2 Videos \(and notes\)](#) and [Writing Project 2 Videos \(and notes\)](#).

Main Method: 0.  $f(x) \Rightarrow$  1.  $a f(x) \Rightarrow$  2.  $a f(x+c) \Rightarrow$  3.  $a f(bx+c) \Rightarrow$  4.  $a f(bx+c)+d = g(x)$

Method 2: 0.  $f(x) \Rightarrow$  1.  $a f(x) \Rightarrow$  2.  $a f(bx) \Rightarrow$  3.  $a f\left(b\left(x+\frac{c}{b}\right)\right) \Rightarrow$  4.  $a f\left(b\left(x+\frac{c}{b}\right)\right)+d = g(x)$

Method 2 seems tougher for most beginners, but is more in keeping with what's ahead of you in mathematics.

Graph the function  $g(x)$  by transforming the graph of a basic function,  $f(x)$ .

1.  $g(x) = 5\sqrt{3x-21} - 2$
2.  $g(x) = -5\sqrt{3x-21} + 2$
3.  $g(x) = 5\sqrt{-3x-21} - 11$
4.  $g(x) = \frac{3}{(-2x+8)^3} + 5$
5.  $g(x) = 5\sqrt[5]{3x+21} - 6$
6.  $g(x) = 5(3x+21)^5 - 6$

We treat lines and parabolas a little differently. They come up so often - plus the completing-the-square trick - we sidestep the whole  $f(bx)$  issue and just work with  $g(x) = a(x-h)^2 + k$  and  $g(x) = m(x-h) + k$ .

7.  $g(x) = 3(x+5) - 7$
8.  $g(x) = 3(x+5)^2 - 7$
9.  $g(x) = x^2 - 4x - 7$
10.  $g(x) = 4x^2 + 5x + 17$

The reason I stress point-slope form:  $y = m(x-h) + k$  corresponds to:  $y = m(x-x_1) + y_1$ .

The "cheat" for completing the square:  $g(x) = ax^2 + bx + c = a(x-h)^2 + k = a\left(x + \frac{b}{2a}\right)^2 + g\left(-\frac{b}{2a}\right)$

Note that  $h = -\frac{b}{2a}$ . A student learning to complete the square might better achieve mastery by checking their work by completing the square with and without the cheat. Make sure results match. Find out why they don't, if they don't. Own it.