

Practice Exam 2 Algebra & Trig 3/17/2003

Each problem is worth 10 points. For full credit provide complete justification for your answers.

1. Find the center and radius of the circle with equation $x^2 + y^2 - 2x - 10y = 55$ and sketch the circle.

2. Find the slope and both x- and y-intercepts of the line with equation $4x - 5y = 10$.

3. Find an equation for the line through the point (3,9) with slope $m = 6$.

4. If $f(x) = x^3$ and $g(x) = x - 2$, find:

$$f(2) =$$

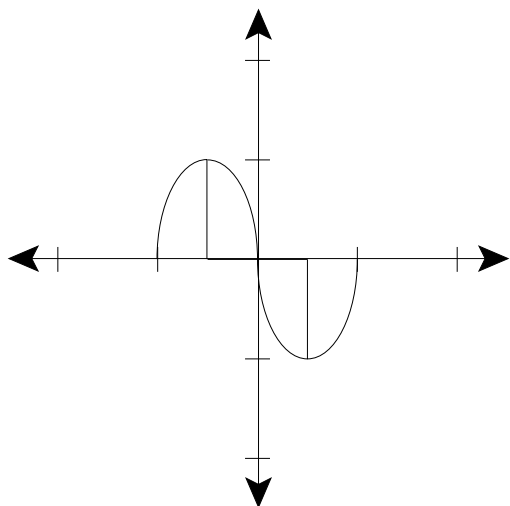
$$g(7) =$$

$$\left(\frac{f}{g} \right) (3) =$$

$$f(2 + h) =$$

$$g(x + h) =$$

5. If $f(x)$ has the graph shown below, sketch graphs of $f(x) + 1$, $f(x-1)$, $f(-x)$, and $2f(x)$.



6. Find all zeros of the polynomial $p(x) = 3x^3 - 2x^2 - 3x + 2$.

7. Factor the polynomial $2x^3 - 9x^2 + 2x + 20$ completely.

8. Decompose $\frac{5x^2 + 2x + 9}{x^4 - 3x^3 + x^2 - 3x}$ into partial fractions.

9. Polly is a Precalc student at Enormous State University, and she's having some trouble with asymptotes. Polly says "Okay, so, like, those rational thingys are totally making me crazy. There was this problem on the practice test, and it told you all this stuff, like, if you know that a rational function has vertical asymptotes at $x = -3$ and $x = 1$, a horizontal asymptote at $x = 0$, and that it crosses the x axis only when $x = 0$, then what are the possible formulas for that function? But, like, it makes it sound like there could be lots of them, and I don't even know how there could be, or how I could find even one of them. And the teacher doesn't speak English hardly at all, and when I went to his office to ask for help he yelled at me and slammed the door in my face. I'm so totally gonna fail!"

Explain to Polly as clearly as possible how you could know what a formula for such a function would be, and how there could be more than one.

10. For what values of b does $f(x) = \frac{x^3 + bx^2 + 3x}{x^2 + 2}$ have exactly two x -intercepts?

Extra Credit (5 points possible): If you were asked what $\sqrt[3]{1}$ is, you'd probably just say 1. However, the equation $x^3 = 1$ has two other solutions as well. Find the other two.