Quiz 10; Friday, April 25, 2008

Print your name:

Problem 1.

Consider the polynomials $f(x) = 2x^3+x^2-2x-1$ and $g(x) = 2x^2+7x+3$ in $\mathbb{Q}[x]$.

Find $gcd(f, g)$ in $\mathbb{Q}[x]$. Give the details of your work.

Solution.

Using the Division Algorithm for polynomials we get:

$$2x^3 + x^2 - 2x - 1 = (x - 3) \cdot (2x^2 + 7x + 3) + 16x + 8$$
$$2x^2 + 7x + 3 = (\frac{1}{8}x + \frac{3}{8})(16x + 8) + 0.$$

Therefore $16x+8 = 16(x+\frac{1}{2})$ is a gcd of f and g in $\mathbb{Q}[x]$. The unique monic gcd of f and g in $\mathbb{Q}[x]$ is $x + \frac{1}{2}$.