

## Problem Sheet 3

The following problems can be solved much more easily if you can spot a clever substitution.

1. Solve for  $x$ :

$$\frac{2x}{2x^2 - 5x + 3} + \frac{13x}{2x^2 + x + 3} = 6.$$

2. If  $x^4 - 8x^3 + 17x^2 - 8x + 1 = 0$ , find  $x$ .

3.  $(t - 4)(t - 5)(t - 6)(t - 7) = 1680$ .

What is  $t$ ?

4. Solve:

$$(8x + 7)^2(4x + 3)(x + 1) = \frac{9}{2}.$$

5. Make a substitution to find two exact real solutions to the equation  $(x + 3)^4 + (x + 5)^4 = 20$ .