Term Test A version 1

(1) [5 points] Solution X is a 27 percent salt solution and Solution Y is a 20 percent salt solution. How much of each is needed to make 42 gallons of a 25 percent salt solution?

(2) [5 points] Solve the equation.

$$(2x-3)^2 + (2x-4)^2 = 4(x-1)^2$$

(3) [5 points] Solve the equation.

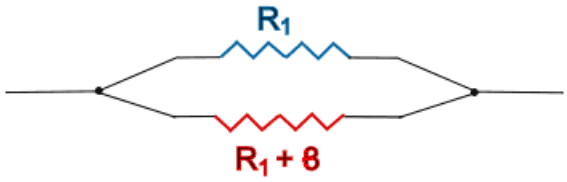
$$\frac{3+x}{2} - \frac{2x-7}{3} = 3$$

(4) [5 points] Two train stations A and B are 310 kilometres apart. The first train leaves A at 6:30am going towards B. The second train leaves B at 7:20am going towards A. The velocity of the first train is 10 kilometres per hour less than the velocity of the second train. At 8:50am the trains are still 65 kilometres apart. Calculate the speed of the two trains and when they will meet. Use $v \cdot t = s$ (velocity times time equals distance).

(5) [5 points] You have 20 gallons of a 45 percent antifreeze solution. How many gallons of a 57 percent antifreeze solution needs to be added to make a 51 percent antifreeze solution?

(6) [5 points] The formula to work out the total resistance R_T given two resistors R_1 and R_2 in parallel as in the diagram is

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2}$$



The total resistance has been measured at 3 ohms, and one of the resistors is known to be 8 ohms more than the other. Ohm is the unit for resistance, and only a positive number of ohms makes sense. Calculate R_1.