$(20+x)\cdot 0.51 = 20\cdot 0.45 + 0.57\cdot x$

$10.2 + 0.51x = 9 + 0.57x$

$1.2 = 0.06x$

$x = \frac{1.2}{0.06} = 20$

Term Test A version 1

(1) [5 points] Solve the equation.

$$\frac{3+x}{2} - \frac{2x-7}{3} = 3$$ 5

(2) [5 points] Rewrite the expression as a single logarithm,

$$2(\log_5 x + 2\log_5 y - 3\log_5 z)$$ $\log_5 \frac{x^2y^4}{z^6}$

(3) [5 points] Rewrite so that there is no logarithm of a product, quotient, root, or power,

$$\ln \frac{x^3\sqrt{x-1}}{3x+4}$$ $3\ln x + \frac{1}{2}\ln(x-1) - \ln(3x+4)$

(4) [5 points] You have 20 gallons of a 45% antifreeze solution. How many gallons of a 57% antifreeze solution needs to be added to make a 51% antifreeze solution? 20

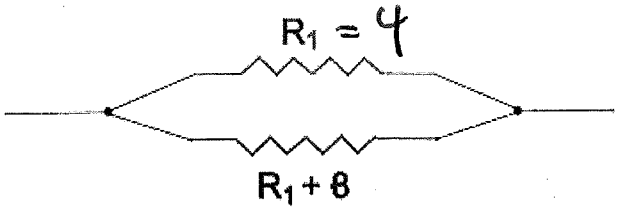
20	0.45	
x	0.57	
20+x	0.51	
x	0.3	0.5x
15−x	0.8	0.8(15−x)
15	0.4	

(5) [5 points] Suppose a car can run on ethanol and gas and you have a 15 gallons tank to fill. You can buy fuel that is either 30 percent ethanol or 80 percent ethanol. How much of each type of fuel should you mix so that the mixture is 40 percent ethanol? 12 and 3

(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.

$15\cdot 0.4 = 0.3x + 0.8\cdot(15-x)$

$6 = 0.3x + 12 - 0.8x$

$0.5x = 6$

$x = \frac{6}{0.5} = 12$

$\frac{1}{3} = \frac{1}{x} + \frac{1}{x+8} = \frac{x+8+x}{x(x+8)} = \frac{2x+8}{x(x+8)}$

$x(x+8) = 6x+24$

$x^2 + 8x = 6x + 24$

$x^2 + 2x - 24 = 0$

$\frac{-2 \mp \sqrt{4+96}}{2} = \frac{-2 \mp 10}{2} = \begin{cases} -6 \\ 4 \end{cases}$