Challenge 2021 Maths III solutions

1) 55 minutes

2) $x = -6, y = -2\frac{1}{2}$

3) 0.29kg

4) a) Angles in pentagon AFGCB = $540°$ so FGC = $130°$

b) FGE=$120°$
EGC=$110°$
EGC+GCD=$180°$ hence result (co-interior angles)
OR as FGE=$120°$ then by alternate angles EG and FA parallel, which is parallel to DC.

5) 10:11 (two properties of wine in this question therefore 2D table ideal) (need to work with actual amount of wine, even though it's a ratio question, so red corked = x, for example)

6) 63, 98 (LCM question)

7) 16.5cm (3 scenarios. Water same in each. Form 2 equations (1st scenario and 2nd scenario gives relationship between r_1 and r_2 then solve using 1st scenario and 3rd scenario)

8) 16%

9) 12

10) 1 hour 24 minutes

11)a) 17

b) 17 first and 4 second

12) HP win by 40 metres

13)a) $x^2 - y^2$

b) Annulus area = $\pi \times 6.7^2 - \pi \times 3.4^2$
$= \pi(6.7^2 - 3.4^2)$
$= (6.7 + 3.3)(6.7 - 3.3)\pi$
$= 34\pi$

c) 7.5cm, 9.5cm (as 17 x 2=34, so x+y=17, x-y=2. Or use 34 x 1 (though lots of other options))

14)a) 540

b) 600

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