

### Year 11 Ratio and Proportion Questions #3

1. Share \$150 in the ratio 2 : 3
2. A farmer has 12 paddocks that have been fertilized and 8 that haven't. Find the ratio of fertilised to unfertilised road.
3. A hospital is meant to have at least 1 nurse for every 8 patients. If there are 190 patients how many nurses should there be?
4. A car yard has 24 new and 18 second hand cars. Find the ratio of new to second hand.
5. A school trip needs at least one adult for every 8 students. If the bus holds 40 people, what is the maximum number of students who can go?
6. Find the smaller share when \$250 is divided in the ratio 3 : 2
7. For footpaths a concrete mix of 1 part cement, 6 parts sand and  $\frac{3}{4}$  parts water is advised by one manufacturer. For 5 buckets of cement, how many of sand and water are needed?
8. If each six bags of cement give  $1.25 \text{ m}^3$  of concrete, how many bags of cement are needed for  $0.5 \text{ m}^3$  of concrete?
9. In a partnership the three partners agree to share profits in the ratio of 2 : 2 : 3. If they have profits of \$260,000, how much should they each get?
10. A farmer is told he should stock his farm with 5 sheep for every 2 cows. If the farm has 80 cows, how many sheep would that mean?
11. How tall should a model of the 49.5 metre tall Vostok rocket be, in mm, if the scale said to be 1:144?
12. The number of junior staff to senior staff at a rest home can be no more than 5 : 2. How many junior staff can 7 senior staff have under them?
13. An inheritance is split in the ratio of the number of grandchildren, which is 3 : 2 : 2. The first division is \$240,000, how much is the whole inheritance
14. A typist can type at 60 words a minute. How long would it take to type 3000 words?
15. A map has a scale of 1 : 50,000. How far in real life is a distance that is 4.5 cm on the map?

### Answers Year 11 Ratio and Proportion Questions #3

1.  $2 + 3 = 5$  parts. Each part is  $= \$150 \div 5 = \$30$ . Split  $1: 7 =$   **$\$60 : \$90$**
2. Fertilised to unfertilised  $= 12 : 8 =$   **$3 : 2$**
3.  $190 \div 8 = 23.75$ , but "at least" means we have to round up  $=$  **24 nurses**.
4. New to second hand  $= 24 : 18 =$   **$4 : 3$** .
5.  $1 + 8 = 9$  parts. Each part  $= 40 \div 9 = 4.44$ . So the split is  $4.44 : 35.55$ . But you need to round, and it is "at least" that many adults, so they can at most have **35 students** (and 5 adults).
6.  $3 + 2 = 5$  parts. Each part  $= \$250 \div 5 = \$50$ . Two parts  $= 2 \times \$50 =$   **$\$100$**
7. cement : sand : water  $= 1 : 6 : 0.75$ . So **30 buckets of sand and 3.75 of water**.
8. Ratio is  $6 : 1.25$  and  $0.5$  is  $0.5/1.25 = 0.4$  of  $1.25 \text{ m}^3$ , so  $0.4 \times 6 =$  **2.4 bags of cement**  
Alternatively: 6 bags is  $1.25 \text{ m}^3$ , so one bag does  $1.25 \div 6 = 0.20833 \text{ m}^3$ . Want  $0.5 \text{ m}^3$  so need  $0.5 \div 0.20833 = 2.4$  bags
9.  $2 + 2 + 3 = 7$  parts. Each part  $= \$260,000 \div 7 = \$37,142$ . They get each two times, two time and three times that, so  **$\$74,286, 74,286$  and  $\$111,428$**
10.  $S : C = 5 : 2$  which is 2.5 sheep for every cow, so  $= 200 : 80 \Rightarrow$  **200 sheep**
11.  $49.5 \text{ m}$  is  $49.5 \times 1000 = 49500 \text{ mm}$ . So the model should be  $49500 \div 144 =$  **344 mm**
12.  $5 : 2$  times 3.5 on both sides gives  $17.5 : 7 =$  **17 junior staff** (18 would be over the ratio allowed)
13.  $3 : 2 : 2 = 7$  parts. If the first 3 parts are worth  $\$240000$ , then each is worth  $240000 \div 3 = \$80,000$ . The full seven parts is therefore  $\$80000 \times 7 =$   **$\$560,000$**
14. Can be done as ratio  $= 60 \text{ words} : 1 \text{ minute}$ . Multiply both sides by 50 gives  $3000 : 50 =$  **50 minutes**
15.  $1 \text{ cm}$  represents  $50,000 \text{ cm}$ , which is  $50000 \div 100 = 500 \text{ m}$ . So  $4.5 \text{ cm}$  is **2250 m** (or 2.25 km, if you prefer)