# Working with ratios: answers

***Education in Chemistry***January 2020  
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## Working with shapes

1. 1:1
2. 1:2
3. 2:1
4. 1:2
5. 2:3
6. 3:2
7. 1:2
8. 1:4
10. 1.3 m2
11. 0.7 m2
12. 7.1 m2

## Working with ratios in chemistry

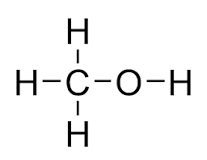
1. 2.08 g
2. x mass of bronze = 10.2

So mass of bronze = 10.2 x = 14.28 g

1. 0.78 g

|  |  |  |  |
| --- | --- | --- | --- |
|  | Carbon | Hydrogen | Oxygen |
| Mass of element in g | 0.585 | 0.195 | 0.78 |
| Moles of element  ( ) | 0.04875 mol | 0.195 mol | 0.04875 mol |
| Simplest whole number ratio  (divide each number by the smallest amount of moles) | 1 | 4 | 1 |

So the simplest formula for X is: CH4O

1. As the simplest unit (empirical formula) has a mass of 12 + (4 x 1) + 16 = 32, and this is equal to the relative molecular mass of X, the molecular formula must be the same as the empirical formula.
2. 

1. Molar mass of white phosphorus, P4 = (31 x 4) = 124 g

Moles of phosphorus, P4 =   
= 0.166.. mol   
= **0.17 mol** (to 2 significant figures)

1. As the ratio of phosphorus to phosphorus(III) fluoride from the chemical equation is 1:4, the moles of the latter must be:

4 x 0.166.. mol = 0.667.. mol   
= **0.67 mol** (to 2 significant figures)

1. Mass of phosphorus(III) fluoride = moles of phosphorus(III) fluoride x molar mass of PF3

Molar mass of PF3 = 31 + (19 x 3) = 88

So mass of PF3 = 0.667.. mol x 88 = 58.7.. g   
= **59 g** (to 2 significant figures)