Working with ratios: answers

Education in Chemistry
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Working with shapes

1.

a)
- i. 1:1
- ii. 1:2

b)
- i. 2:1
- ii. 1:2
- iii. 2:3

c)
- i. 3:2
- ii. 1:2
- iii. 1:4

2.

a) $\frac{1}{8}$

b) $\frac{7}{16}$

c) $\frac{1}{8}$

3.

a)
- i. $\frac{1}{7}$
- ii. $\frac{1}{13}$

b)
- i. 1.3 m^2
- ii. 0.7 m^2

c) 7.1 m^2

Working with ratios in chemistry

1.

a) $\frac{2}{5}$

b) 2.08 g

c) $\frac{5}{7}$

d) $\frac{5}{7}$ x mass of bronze = 10.2

So mass of bronze = 10.2 x $\frac{7}{5}$ = 14.28 g

2.

a) 0.78 g

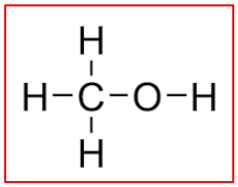
b)

	Carbon	Hydrogen	Oxygen
Mass of element in g	0.585	0.195	0.78
Moles of element ($\frac{mass\ in\ g}{A_r}$)	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: CH_4O

c) 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.

d)



3.

a) Molar mass of white phosphorus, P_4 = (31 x 4) = 124 g
Moles of phosphorus, P_4 = $\frac{20.7}{124}$
= 0.166.. mol
= **0.17 mol** (to 2 significant figures)

b) 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)

c) Mass of phosphorus(III) fluoride = moles of phosphorus(III) fluoride x molar mass of PF_3
Molar mass of PF_3 = 31 + (19 x 3) = 88
So mass of PF_3 = 0.667.. mol x 88 = 58.7.. g
= **59 g** (to 2 significant figures)