

# Math for Occupational Hygienists

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Model Answers

# Answers (1):

Question	equation	result	units
1	$728 / 1000$	0.728	m <sup>3</sup>
2	$1.002 \times 1000$	1002	litres
3	$275 / 1000$	0.275	mg
4	$2.01 \times 1000$	2010	μg
5	$0.012 \times 1000 \times 1000$	12000	μg
6	$48000 / 1000$	48.0	litres

## Answers(2):

1. Time 413 (min) x 1.77 (l/min) / 1000 = 0.73 m<sup>3</sup>
2. Time 153 (min) x 1.06 (l/min) / 1000 = 0.16 m<sup>3</sup>
3. Time 673 (min) x 2.10 (l/min) / 1000 = 1.41 m<sup>3</sup>
4. Time 436 (min) x 1.93 (l/min) / 1000 = 0.84 m<sup>3</sup>

# Calculation of Personal Exposure - answer (3)

Time of sample: 09:12 to 15:45 = 393 mins

Sample Volume = Flow Rate of Pump x Time

Sample Volume = 2.0 l/min x 393 mins

Sample Volume = 786 litres

Sample Volume = 0.79 m<sup>3</sup>

Mass of material on filter = 25.82 - 27.21 mg

Mass of material on filter = 1.39 mg + 0.01mg = 1.40 mg

Personal Exposure = 1.40 mg / 0.79 m<sup>3</sup>

Personal Exposure = 1.77 mg/m<sup>3</sup>

# Calculation of Personal Exposure – answer (4)

Time of sample: 08:45 to 15:30 = 405 mins

Sample Volume = Flow Rate of Pump x Time

Sample Volume = 2.1 l/min x 405 mins

Sample Volume = 850.5 litres

Sample Volume = 0.85 m<sup>3</sup>

Mass of material on filter = 31.84 – 24.66 mg

Mass of material on filter = 1.39 mg = 7.81 mg (note: no blank weight given)

Personal Exposure = 7.81 mg / 0.85 m<sup>3</sup>

Personal Exposure = 9.19 mg/m<sup>3</sup>

# Answers (5):

1. Time 467 (min) x 99.5 (l/min) / 1000 = 46.47 litres
2. Time 374 (min) x 101 (l/min) / 1000/ 1000 = 0.038 m<sup>3</sup>
3. Time 614 (min) x 47.0 (l/min) / 1000 = 28.86 litres
4. Time 496 (min) x 92.0 (l/min) / 1000 = 45.63 litres

# Answers (6):

- 1 Time 467 (min) x 99.5 (ml/min) / 1000 = 46.47 litres  
 $219/46.47 = 4.71 \text{ mg/m}^3$
- 2 Time 374 (min) x 101 (ml/min) / 1000 = 37.77 litres  
 $78/37.77 = 2.07 \text{ mg/m}^3$
- 3 Time 614 (min) x 47.0 (ml/min) / 1000 = 28.86 litres  
 $12.9/28.86 = 0.45 \text{ mg/m}^3$
- 4 Time 496 (min) x 92.0 (ml/min) / 1000 = 45.63 litres  
 $781/45.63 = 17.12 \text{ mg/m}^3$