MATHSFORNURSES

Doses with Unit Conversions – Worked Solutions

Question 1

A patient is prescribed 3g of a drug that is available in a solution with a stock dose of 600mg/100ml. How much of the solution should the patient be given?

The first step is to make sure that the prescribed dose (3g) and the stock dose (600mg) are in the same unit. The easiest way to do this is to convert them both into the smaller unit (mg), so you need to convert 3g into mg.

Because you are converting from a larger unit to a smaller one, you multiply by the scale factor of 1000, so the new prescribed dose will be 3 × 1000 = 3000mg.

Now to work out the volume that you would give, you can divide the prescribed dose by the stock dose and multiply your answer by the volume that the stock dose is in as before.

The prescribed dose is now 3000mg. The stock dose is 600mg and it is in a volume of 100ml.

First, work out 3000 ÷ 600. Write this as the fraction $\frac{3000}{600}$ then simplify this by dividing both numbers by 100 to get $\frac{30}{6}$, and then divide both numbers by 6 to end up with $\frac{5}{1}$, or just 5.

Then work out 5 × 100ml, which will be 500ml.

Answer: 500ml

Question 2

A patient is prescribed 1.5g of a drug that is available in a solution with a stock dose of 125mg/20ml. How much of the solution should the patient be given?

The first step is to make sure that the prescribed dose (1.5g) and the stock dose (125mg) are in the same unit. The easiest way to do this is to convert them both into the smaller unit (mg), so you need to convert 1.5g into mg.

Because you are converting from a larger unit to a smaller one, you multiply by the scale factor of 1000, so the new prescribed dose will be 1.5 × 1000 = 1500mg.

Now to work out the volume that you would give, you can divide the prescribed dose by the stock dose and multiply your answer by the volume that the stock dose is in as before.

The prescribed dose is now 1500mg. The stock dose is 125mg and it is in a volume of 20ml.

First, work out 1500 ÷ 125. Write this as the fraction $^{1500}/_{125}$ then simplify this by dividing both numbers by 5 to get $^{300}/_{25}$, and then divide both numbers by 5 again to end up with $^{60}/_{5}$, and then by 5 one more time to end up with $^{12}/_{1}$, or just 12.

Then work out 12 × 20ml, which will be 240ml.

Answer: 240ml

Question 3

A patient is prescribed 400mg of a drug that is available in a solution with a stock dose of 2g/150ml. How much of the solution should the patient be given?

The first step is to make sure that the prescribed dose (400mg) and the stock dose (2g) are in the same unit. The easiest way to do this is to convert them both into the smaller unit (mg), so you need to convert 2g into mg.

Because you are converting from a larger unit to a smaller one, you multiply by the scale factor of 1000, so the new stock dose will be 2 × 1000 = 2000mg.

Now to work out the volume that you would give, you can divide the prescribed dose by the stock dose and multiply your answer by the volume that the stock dose is in as before.

The prescribed dose is 400mg. The stock dose is now 2000mg and it is in a volume of 150ml.

First, work out 400 ÷ 2000. Write this as the fraction $^{400}/_{2000}$ then simplify this by dividing both numbers by 100 to get $^{4}/_{20}$, and then divide both numbers by 4 to end up with $^{1}/_{5}$, which is the same as the decimal 0.2

Then work out 0.2 × 150ml, which will be 30ml (2 × 150 = 300, so 0.2 × 150 = 30).

Answer: 30ml

Question 4

A patient is prescribed 10mg of a drug that is available in a solution with a stock dose of 500µg/5ml.   How much of the solution should the patient be given?

The first step is to make sure that the prescribed dose (10mg) and the stock dose (500μg) are in the same unit. The easiest way to do this is to convert them both into the smaller unit (μg), so you need to convert 10mg into μg.

Because you are converting from a larger unit to a smaller one, you multiply by the scale factor of 1000, so the new prescribed dose will be 10 × 1000 = 10000μg.

Now to work out the volume that you would give, you can divide the prescribed dose by the stock dose and multiply your answer by the volume that the stock dose is in as before.

The prescribed dose is now 10000μg. The stock dose is 500μg and it is in a volume of 5ml.

First, work out 10000 ÷ 500. Write this as the fraction $\frac{10000}{500}$ then simplify this by dividing both numbers by 100 to get $\frac{100}{5}$, and then divide both numbers by 5 to end up with $\frac{20}{1}$, which is just 20.

Then work out 20 × 5ml, which is 100ml.

Answer: 100ml

Question 5

A patient is prescribed 6μg of a drug that is available in a solution with a stock dose of 750ng/ml. How much of the solution should the patient be given?

The first step is to make sure that the prescribed dose (6μg) and the stock dose (750ng) are in the same unit. The easiest way to do this is to convert them both into the smaller unit (ng), so you need to convert 6μg into ng.

Because you are converting from a larger unit to a smaller one, you multiply by the scale factor of 1000, so the new prescribed dose will be 6 × 1000 = 6000ng.

Now to work out the volume that you would give, you can divide the prescribed dose by the stock dose and multiply your answer by the volume that the stock dose is in as before.

The prescribed dose is now 6000ng. The stock dose is 750ng and it is in a volume of 1ml.

First, work out 6000 ÷ 750. Write this as the fraction $\frac{6000}{750}$ then simplify this by dividing both numbers by 10 to get $\frac{600}{75}$, and then divide both numbers by 5 to end up with $\frac{120}{15}$, then divide the numbers by 5 again to get $\frac{24}{3}$, and finally divide both numbers by 3 to get $\frac{8}{1}$, which is just 8.

Then work out 8 × 1ml, which is 8ml.

Answer: 8ml