## M3.4 – Determine the intercept of a graph

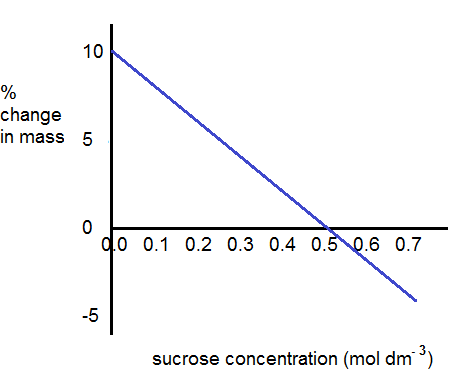
## Teacher answers

### Quiz

**1.** An experiment was carried out to find the water potential of the cells in potato tubers.

Cylinders of potato were cut from potatoes and weighed. These cylinders were then immersed in sucrose solutions of different concentrations for 4 hours. The cylinders were then weighed again and the percentage change in mass was recorded.

The results were plotted and the line of best fit is shown in the graph below.



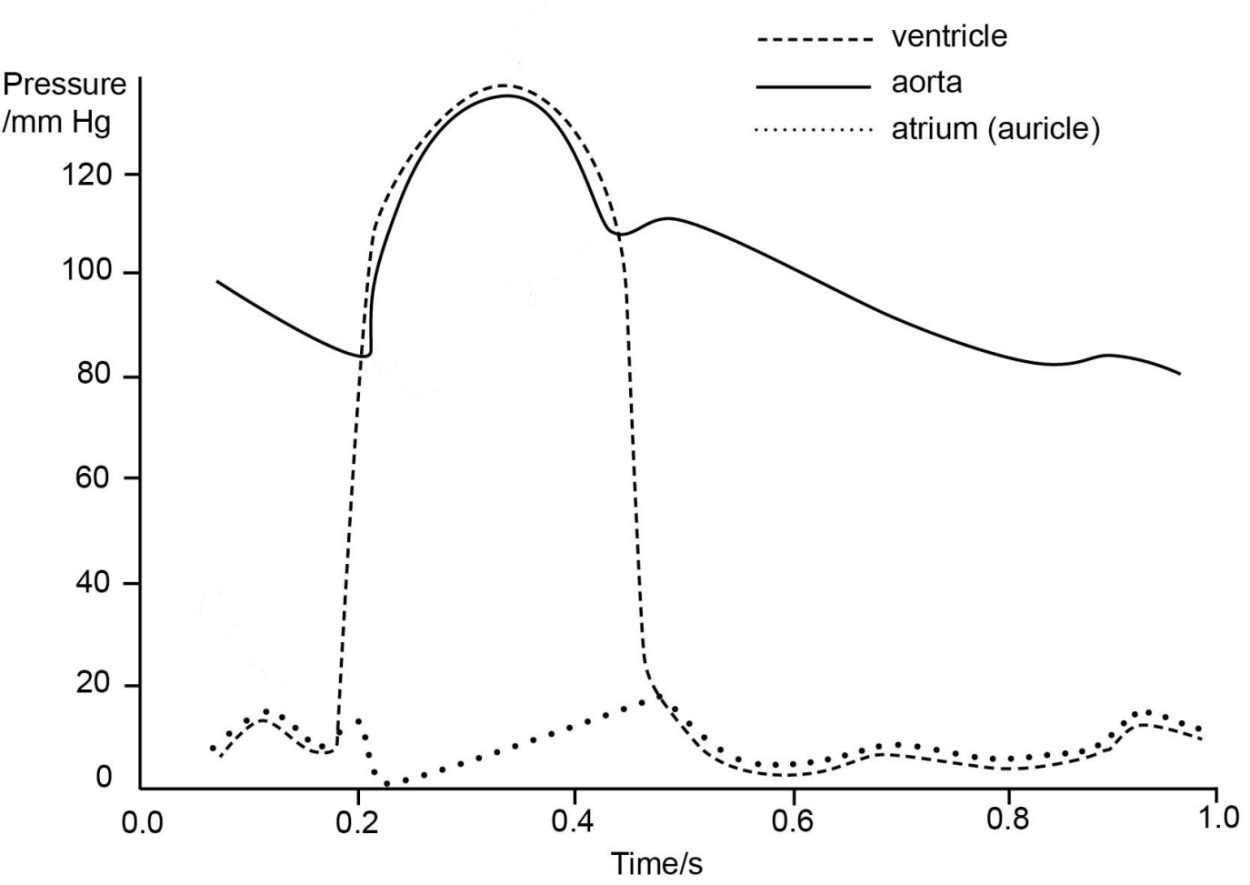
What are the intercepts in this graph?

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| The y intercept is (0, 10) meaning that when sucrose concentration was 0 mol dm-3 the potato cylinders increased in mass by 10%  The x intercept is (0.5, 0) meaning that there was no change in mass of the cylinders when the sucrose concentration was 0 mol dm-3 |

Which intercept will be used to find the water potential of the cells?

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| --- |
| The x intercept will be used to find the water potential. This is tells us the sucrose concentration where the water potential of the sucrose solution is the same as that of the potato cells and so there is no net movement of water by osmosis in or out of the cells. |

**2.** Measurements were made of pressure changes within the left side of the heart and the aorta during the cardiac cycle of a healthy adult human. The intercepts of the various curves indicate moments in the cycle when pressure is equal in the two chambers or vessels. This is when valves open and close.



Identify the intercepts and give their meanings in terms of valve opening/closing.

|  |
| --- |
| (0.18, 10): at 0.18 s the pressure in the atrium and ventricle is equal at 10 mm Hg. The bicuspid (or atrioventricular) valve closes.  (0.48, 18): at 0.48 s the pressure in the atrium and ventricle is equal at 18 mm Hg. The bicuspid (or atrioventricular) valve opens.  (0.20, 84): at 0.20 s the pressure in the ventricle and aorta is equal at 84 mm Hg. The semilunar (or aortic) valve opens.  (0.44, 108): at 0.44 s the pressure in the ventricle and aorta is equal at 108 mm Hg. The semilunar (or aortic) valve closes. |

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