

	Percentage Increase and Decrease	
1	An industrial machine costs £176500. Its value depreciates by 4.25% each year. How much is it worth after 3 years?	3
2	Iain's annual salary is £28 400. He expects his salary to increase steadily by 2.3% per anum. What will Iain's salary be after 3 years. Give your answer to the nearest pound.	3
3	In the evening, the temperature in a greenhouse drops by 4% per hour. At 8 pm the temperature is 28°C. What will the temperature be at 11 pm?	3
4	£50 000 is placed in a long-term savings account with an interest rate of 4.5% per anum. Calculate the total amount held in the savings account after 4 years. Give your answer rounded to the nearest penny.	3
5	The value of a boat is expected to fall at a steady rate of 8.6% per year. The initial value of the boat is £35 000. Calculate its value after 3 years. Give your answer rounded to the nearest pound.	3
	<b>15 marks</b>	

	Percentage - Answers	15
1	<p>Mark 1 Know how to find a percentage decrease <math>100 - 4.25 = 95.75\% = 0.9575</math></p> <p>Mark 2 Use this answer to find value over three years <math>176500 \times 0.9575^3</math> or <math>\left(\frac{95.75}{100}\right)^3</math></p> <p>Mark 3 Calculate the answer <b>£154939.11</b></p> <p>Full marks will be given for finding percentage decrease each year for 3 years.  <i>Year 1</i> <math>£176500 \times 0.9575 = 168998.75</math>. <i>Year 2</i> <math>£161816.3031</math>. <i>Year 3</i> <math>£154939.11</math>            2 marks will be given for a percentage increase <math>176500 \times 1.0425^3 = £199973.71</math>            No marks will be given for taking away 3 lots of 4.25% <math>\rightarrow 176500 - 3 \times 7501.25 = £153996.25</math></p>	3
2	<p>Mark 1 Know how to find a percentage increase <math>100 + 2.3 = 102.3\% = 1.023</math></p> <p>Mark 2 Use this answer to find value over three years <math>28400 \times 1.023^3</math> or <math>\left(\frac{102.3}{100}\right)^3</math></p> <p>Mark 3 Calculate the answer rounded to the nearest pound <b>£30405</b></p> <p>Full marks will be given for finding percentage increase each year for 3 years.  <i>Year 1</i> <math>£28400 \times 1.023 = 29053.20</math> <i>Year 2</i> <math>£29721.4236</math>.  <i>Year 3</i> <math>£30405.01634 = £30405</math></p> <p>2 marks will be given for a percentage decrease <math>28400 \times 0.977^3 = £26485.12526 = £26485</math>            No marks will be given for adding 3 lots of 2.3% <math>\rightarrow 28400 + 3 \times 653.2 = £30359.60 = £30360</math></p>	3
3	<p>Mark 1 Know how to find a percentage decrease <math>100 - 4 = 96\% = 0.96</math></p> <p>Mark 2 Use this answer to find value over three hours <math>28 \times 0.96^3</math> or <math>\left(\frac{96}{100}\right)^3</math></p> <p>Mark 3 Calculate the answer <b>24.8 °C</b></p> <p>Full marks will be given for finding percentage decrease each year for 4 years.  <i>9 pm</i> <math>28 \times 0.96 = 26.88</math>. <i>10 pm</i> <math>25.8048</math>. <i>11 pm</i> <math>24.772608 = 24.8 °C</math>            2 marks will be given for a percentage increase <math>28 \times 1.04^3 = 31.496192 = 31.5 °C</math>            No marks will be given for taking away 3 lots of 4% <math>\rightarrow 28 - 3 \times 1.12 = 24.64 °C</math></p>	3
4	<p>Mark 1 Know how to find a percentage increase <math>100 + 4.5 = 104.5\% = 1.045</math></p> <p>Mark 2 Use this answer to find value over three years <math>50000 \times 1.045^4</math> or <math>\left(\frac{104.5}{100}\right)^4</math></p> <p>Mark 3 Calculate the answer rounded to the nearest penny. <b>£59625.93</b></p> <p>Full marks will be given for finding percentage increase each year for 4 years.  <i>Year 1</i> <math>£50000 \times 1.045 = 52250</math>. <i>Year 2</i> <math>£54601.25</math>.  <i>Year 3</i> <math>£57058.30625</math>. <i>Year 4</i> <math>£59625.93003 = £59625.93</math></p> <p>2 marks will be given for a percentage decrease <math>50000 \times 95.5^4 = £40725.3125 = £40725.31</math>            No marks will be given for adding 4 lots of 4.5% <math>\rightarrow 50000 + 4 \times 2250 = £41000</math></p>	3
5	<p>Mark 1 Know how to find a percentage decrease <math>100 - 8.6 = 91.4\% = 0.914</math></p> <p>Mark 2 Use this answer to find value over three years <math>35000 \times 0.914^3</math> or <math>\left(\frac{91.4}{100}\right)^3</math></p> <p>Mark 3 Calculate the answer rounded to the nearest pound <b>£26724</b></p> <p>Full marks will be given for finding percentage decrease each year for 3 years.  <i>Year 1</i> <math>£35000 \times 0.914 = 31990</math>. <i>Year 2</i> <math>29238.86</math>. <i>Year 3</i> <math>26724.31 = £26724</math>            2 marks will be given for a percentage increase <math>35000 \times 1.086^3 = £44828.84196 = £44829</math>            No marks will be given for taking away 3 lots of 8.6% <math>\rightarrow 35000 - 3 \times 3010 = £25970</math></p>	3