NATIONAL 5 MATHEMATICS – APPLICATIONS UNIT 1 PRACTICE ASSESSMENT 1

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| Q1. |  | Simplify, giving your answer in surd form:  √18 | (2) |
| Q2. |  | Simplify: |  |
|  | (a) | (i) $\frac{y^{3} × y^{5}}{y^{2}}$ | (2) |
|  |  | (ii) $2a^{\frac{3}{2}} × 5a^{-\frac{1}{2}}$ | (2) |
|  | (b) | The Aircraft Journal reported:*“the top airline’s oldest jumbo jet has now flown 3.168 x 107 miles”*This is equivalent to 132 trips from the earth to the moon.Calculate the distance from the earth to the moon.Give your answer in scientific notation. | (2) |
| Q3. |  | Expand and simplify where appropriate: |  |
|  | a) | 4(4x – y) | (1) |
|  | b) | (x + 3)(x + 1) | (2) |
| Q4. |  | Factorise: |  |
|  | a) | y2 – 3y | (1) |
|  | b) | p2 – q2 | (1) |
|  | c) | x2 – x – 12 | (2) |
|  |  |  |  |
| Q5 |  | Express $x^{2}+2x+5$ in the form $(x-b)^{2}+c$ .  | (2) |
| Q6 |  | Write $\frac{(3x+6)(x+7)}{(x+7)^{2}}$ , $x \ne -7$  in its simplest form. | (1) |
| Q7 |  | Write each of the following as a single fraction: |  |
|  | (a) |  $x , y \ne 0$ | (2) |
|  | (b) |  , $b , c \ne 0$ | (2) |
|  |  |  |  |
| Q8 |  | A is the point ( -1 , -2 ) and B is the point ( 3 , 7 ). Calculate the gradient of AB. | (2) |
|  |  |  |  |
| Q9 |  | The sphere shown has a radius of 3.7cm. Calculate the volume, giving your answer to 2 significant figures. |  |
|  |  |  http://exchangedownloads.smarttech.com/public/content/ac/aced4b34-69d8-436a-98e3-f9fd5104987f/previews/medium/0001.png | (3) |
| Q10 |  | A dairy currently produces a pack of butter in the shape of a cylinder. The radius is 3.7cm and the height is 9.5cm. |  |
|  |  |   |  |
|  |  | The dairy then decide to change the shape of the pack to a cubiod with dimensions 7.5cm x 5.5cm x 10cm. The purchase price of the packs are the same.Which pack is better value and why? | (4) |
|  |  |  |  |
| Q11 |  | A primary school class are making Angel decorations for Christmas.The Angel is made from a conical base section as shown below. |  |
|  |  | http://www.0to5.com.au/images/christmas_angel_activity04sm.jpg |  |
|  |  | In the diagram below, the shaded area shows the paper used in construction of the angel. |  |
|  |  | **210˚**A BoAB is a major arc of the circle shown with centre O.The radius OA is 13 cm.Angle AOB is 210˚. |  |
|  | (a) | Calculate the length of the major arc AB. | (1) |
|  | (b) | Each Angel will have a piece of silver ribbon glued around its base.The teacher has 5 metres of ribbon.How many Angels can be made with the 5 metres of ribbon. | (3) |