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| Year 10 | | *Surface Area and Volume of Other Solids* | Calculator  Allowed |
| **Skills and Knowledge Assessed:**   * Solve problems involving surface area and volume of right pyramids, right cones, spheres and related composite solids (ACMMG271) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 1** Short Answer Section | | | |
| Write all working and answers in the spaces provided on this test paper. | | | |
|  | What is the volume of the prism shown?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | What is the volume of the square pyramid?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | A rectangular pyramid has base edges 15 cm and 10 cm and a perpendicular of height 8 cm.  What is its volume?  ……………………………………………………………………………………………....  …………………………………………………………………………………………….... | | |
|  | A cone has a height of 18 cm and the area of its base is 200 cm2.  What is its volume?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | An Egyptian pyramid has a square base 120 m long and the slant height of each face is 80 m.  What is the surface area of its exposed faces?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | A regular tetrahedron has 4 congruent triangular faces with the dimensions (to the nearest half cm) shown on the diagram.  What is the surface area of the regular tetrahedron?  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | Joan wants to make a square pyramid as shown.  Its base measures 30 cm along each side.  She wants the volume to be 12 000 cm3.  What height should she make the pyramid?  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | What is the volume of this cone?  Answer in terms of  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | What is the surface area of the square pyramid shown?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | What is the surface area of the sphere?  Answer in terms of  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | What is the volume of the building shown?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | The dome on a cathedral in Florence can be approximated by a hemisphere of diameter 44 metres.  What is the surface area of the dome (in terms of )?  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | The building was designed to house an observatory and has cylindrical walls and a hemispherical roof.  Ignoring the thickness of the walls, what is the volume of the building in terms of ?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | What is the surface area of this cone, in terms of ?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |
|  | The octahedron shown consists of two identical square pyramids, joined at their bases  What is the volume of the octahedron?  ………………………………………………  ……………………………………………....  ………………………………………………  …………………………………………….... | | |

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| Year 10 | | *Surface Area and Volume of Other Solids* | Calculator Allowed |
| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 2** Multiple Choice Section | | | |
| Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section. | | | |
|  | Find the volume of the cylinder shown (to the nearest cm).  A. 670 cm3  B. 2 011 cm3  C. 2 145 cm3  D. 8 042 cm3 | | |
|  | A triangular pyramid has a perpendicular height of 6 cm and its base has an area of 30 cm2.  What is its volume?  A. 30 cm3  B. 33 cm3  C. 60 cm3  D. 90 cm3 | | |
|  | This solid is made by stacking cubes which measure 5 cm along each edge.  What is the total volume of the solid formed?  A. 400 cm3  B. 800 cm3  C. 1000 cm3  D. 2000 cm3 | | |
|  | The octagonal pyramid is 2.5 m high and its base has an area of 3.6 m2.  Find its volume.  A. 3.0 cm3  B. 4.5 cm3  C. 5.25 cm3  D. 9.0 cm3 | | |
|  | What is the volume of the rectangular pyramid?  A. 96 cm3  B. 240 cm3  C. 360 cm3  D. 720 cm3 | | |
|  | What is the volume of a sphere which has a radius of 2.5 metres?  A. 16 m3 B. 49 m3 C. 65 m3 D. 196 m3 | | |
|  | What is the surface area of the square pyramid?  A. 132 cm2  B. 156 cm2  C. 264 cm2  D. 312 cm2 | | |
|  | A large vase is in the shape of a rectangular pyramid.  How many litres of water can it hold?  1000 cm3 holds 1 litre of water.  A. 3.6 litres  B. 47.25 litres  C. 70.88 litres  D. 141.75 litres | | |
|  | Calculate the volume of the triangular prism shown.  A. 1.25 m3  B. 2.5 m3  C. 3.75 m3  D. 4.375 m3 | | |
|  | A globe of the earth is a 20 cm diameter sphere.  What is the surface area of the globe?  A. 314 cm2  B. 471 cm2  C. 628 cm2  D. 1 257 cm2 | | |
|  | What is the surface area of the square pyramid shown?    A. 672 cm2  B. 767 cm2  C. 800 cm2  D. 1 280 cm2 | | |
|  | A glasshouse is a geodesic dome, which is approximately the size of a hemisphere with a diameter of 25 metres.  What is the approximate area of glass that would be needed for the glasshouse?  A. 157 m2  B. 981 m2  C. 1953 m2  D. 1963 m2 | | |
|  | The design for a solid wooden spinning top is in the shape of a cone topped by a hemisphere and then a smaller cylinder.  A cross section of the spinning top is shown with its dimensions given.  What is the volume of the spinning top?  A.  B.  C.  D. | | |
|  | A hemisphere has a volume of 2.5 m3.  What is its diameter, to the nearest cm?  A. 0.56 m  B. 1.06 m  C. 2.12 m  D. 7.50 m | | |
|  | The solid shown is formed by cutting the top 8 cm in height from a square pyramid which originally had a height of 16 cm and a base with sides of 12 cm.  What is the volume of the truncated pyramid?  A. 96 cm3  B. 127 cm3  C. 384 cm3  D. 672 cm3 | | |

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| Year 10 | *Surface Area and Volume of Other Solids* | Calculator Allowed |
| Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Section 3** Longer Answer Section | | |
| Write all working and answers in the spaces provided on this test paper. | | |

|  | | **Marks** |
| --- | --- | --- |
| 1. | The square pyramid below has a base which measures 66 cm and a perpendicular height of 56 cm. |  |
|  | (a) Calculate the volume of the pyramid.  ……………………………………………………………………………………..  …………………………………………………………………………………….. | **1** |
|  | (b) Calculate the slant height of the pyramid.  ……………………………………………………………………………………..  …………………………………………………………………………………….. | **1** |
|  | (c) Calculate the surface area of the pyramid.  ……………………………………………………………………………………..  …………………………………………………………………………………….. | **2** |

*Multiple Choice Answer Sheet*

*Surface Area and Volume of Other Solids*

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

13. A B C D

14. A B C D

15. A B C D

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| Year 10 | | *Surface Area and Volume of Other Solids* | Non Calculator |
| **Section 1** Short Answer Section | | | |
| ANSWERS | | | |
| No. | WORKING | | ANSWER |
|  |  | | 300 m3 |
|  |  | | 700 cm3 |
|  |  | | 400 cm3 |
|  |  | | 1 200 cm3 |
|  |  | | 19 200 m2 |
|  |  | | 680 cm2 |
|  |  | | 40 cm |
|  |  | |  |
|  |  | | 360 cm2 |
|  |  | |  |
|  |  | | 640 m3 |
|  |  | |  |
|  |  | |  |
|  |  | |  |
|  |  | | 1500 cm3 |

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| Year 10 | | *Surface Area and Volume of Other Solids* | Calculator Allowed | |
| **Section 2** Multiple Choice Section | | | | |
| ANSWERS | | | | |
| No. | WORKING | | | ANSWER |
|  |  | | | B |
|  |  | | | C |
|  | There are 16 cubes, by counting. | | | D |
|  |  | | | A |
|  |  | | | B |
|  |  | | | C |
|  |  | | | A |
|  |  | | | B |
|  |  | | | A |
|  |  | | | D |
|  |  | | | C |
|  |  | | | D |
|  |  | | | A |
|  |  | | | B |
|  |  | | | D |

*Multiple Choice Answer Sheet*

*Surface Area and Volume of Other Solids*

Name \_\_\_\_\_\_\_ANSWERS\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Completely fill the response oval representing the most correct answer.

1. A B C D

2. A B C D

3. A B C D

4. A B C D

5. A B C D

6. A B C D

7. A B C D

8. A B C D

9. A B C D

10. A B C D

11. A B C D

12. A B C D

13. A B C D

14. A B C D

15. A B C D

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| Year 10 | | *Surface Area and Volume of Other Solids* | Calculator Allowed | |
| **Section 3** Longer Answer Section | | | | |
| ANSWERS | | | | |
|  | | | | **Marks** |
| 1. | (a) | | | **1** |
|  | (b) | | | **1** |
|  | (c) | | | **2** |