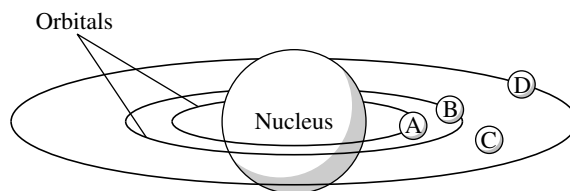


**CHAPTER 4 REVIEW***Arrangement of Electrons in Atoms***SECTION 2****SHORT ANSWER** Answer the following questions in the space provided.

- \_\_\_\_\_ How many quantum numbers are used to describe the properties of electrons in atomic orbitals?  
(a) 1 (c) 3  
(b) 2 (d) 4
- \_\_\_\_\_ A spherical electron cloud surrounding an atomic nucleus would best represent  
(a) an *s* orbital. (c) a combination of two different *p* orbitals.  
(b) a *p* orbital. (d) a combination of an *s* and a *p* orbital.
- \_\_\_\_\_ How many electrons can an energy level of  $n = 4$  hold?  
(a) 32 (c) 8  
(b) 24 (d) 6
- \_\_\_\_\_ How many electrons can an energy level of  $n = 2$  hold?  
(a) 32 (c) 8  
(b) 24 (d) 6
- \_\_\_\_\_ Compared with an electron for which  $n = 2$ , an electron for which  $n = 4$  has more  
(a) spin. (c) energy.  
(b) particle nature. (d) wave nature.
- \_\_\_\_\_ According to Bohr, which is the point in the figure below where electrons cannot reside?  
(a) point A (c) point C  
(b) point B (d) point D



- \_\_\_\_\_ According to the quantum theory, point D in the above figure represents  
(a) the fixed position of an electron.  
(b) the farthest position from the nucleus that an electron can achieve.  
(c) a position where an electron probably exists.  
(d) a position where an electron cannot exist.

**SECTION 2** continued

8. How did de Broglie conclude that electrons have a wave nature?

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9. Identify each of the four quantum numbers and the properties to which they refer.

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10. How did the Heisenberg uncertainty principle contribute to the idea that electrons occupy “clouds,” or “orbitals”?

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11. Complete the following table:

<b>Principal quantum number, <math>n</math></b>	<b>Number of sublevels</b>	<b>Types of orbitals</b>
1		
2		
3		
4		