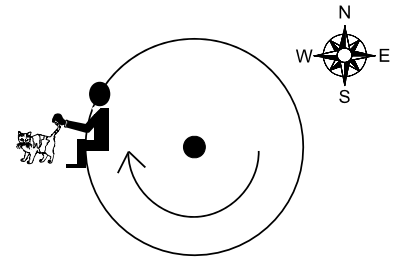


Write the letter corresponding to the best answer in the blank at the left of each question.

- \_\_\_\_\_ 1. Mr. M and Fluffy were riding on a merry-go-round as shown in the overhead view at right. When they were at the indicated position, what was the direction of the force pulling on them?  
 A) due north                      B) due west  
 C) due east                        D) northeast



- \_\_\_\_\_ 2. When Mr. M and Fluffy were at the indicated position, what was the direction of their acceleration?  
 A) due north                      B) due west  
 C) due east                        D) northeast
- \_\_\_\_\_ 3. Mr. M let Fluffy go at the position shown in the diagram. In what direction did Fluffy fly off?  
 A) due north                      B) due west                      C) due east                      D) northeast
- \_\_\_\_\_ 4. After letting Fluffy go, Mr. M got up and started walking toward the center of the merry-go-round. How did his **angular** speed change?  
 A) it became larger  
 B) it remained the same  
 C) it became smaller
- \_\_\_\_\_ 5. As he walked inward, how did his **linear** speed change?  
 A) it became larger  
 B) it remained the same  
 C) it became smaller
- \_\_\_\_\_ 6. A satellite's orbit around the planet decays such that its orbital radius halves. What would its new weight be, if expressed in terms of its original weight  $F_g$ ?  
 A)  $1/4 F_g$                       B)  $F_g$                               C)  $2 F_g$                               D)  $4 F_g$                               E)  $8 F_g$
- \_\_\_\_\_ 7. What would the satellite's new orbital period be, if expressed in terms of its original period  $T$ ?  
 A)  $0.354 T$                       B)  $0.500 T$                       C)  $1.12 T$                               D)  $1.25 T$                               E)  $2 T$

**PRACTICE your math with these problems from Serway & Faughn 7<sup>th</sup> Ed.: Chapter 7, pages 220-221: # 37, 43, 47 (answers in back of book!)**

**ANSWERS:**

1) C (inward/centripetal force)  
 2) C (inward/centripetal acceleration)  
 3) A (linear tangential velocity)  
 4) B (same rev/sec no matter where you are on a solid spinning surface)  
 5) C (decreasing radius reduces  $v = (2\pi r)/T$  since period is constant on a spinning solid)  
 6) D ( $F_g$  is inversely proportional to the square of  $d$ , so  $(1/2)d$  is on the bottom and squared, and  $1 / (1/2)^2 = 1 / (1/4) = 4$ )  
 7) A ( $T^2 \propto r^3$  so  $T \propto r^{3/2}$  and  $1/2 r$  means you get  $(1/2)^{3/2} = 0.354$ )