



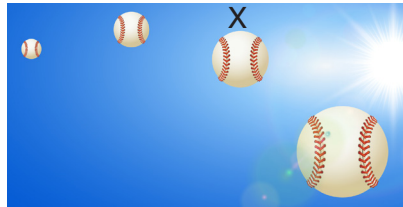
# KNOWLEDGE AREA: MECHANICS

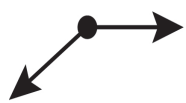



## Questions

### Multiple-choice questions:

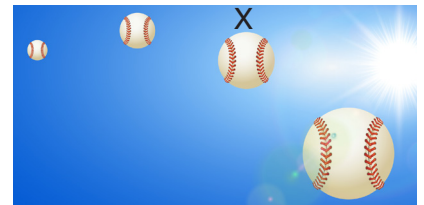
Four possible answers are given for the following questions. Each question has only ONE correct answer. Choose the correct answer and mark the applicable LETTER with a cross (X).





1. A cricket ball flies through the air after a batsman has hit it. Which one of the following vector diagrams represents the free body diagram of the ball at position X?



- A.  B.  C.  D. 

2. A cricket ball flies through the air after a batsman has hit it. Which one of the following vector diagrams represents acceleration of the ball at position X?




- A.  B.  C.  D. 

3. A soccer ball is kicked against a wall. The magnitudes of the momentum towards the wall and away from the wall, was  $3x$  and  $2x$  respectively with directions as indicated in the diagram.

$$p_{\text{before}} \longrightarrow 3x$$

$$p_{\text{after}} \longleftarrow 2x$$

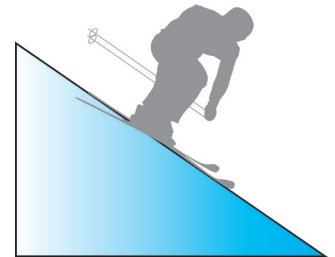
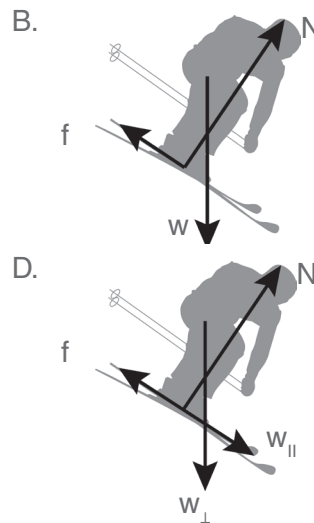
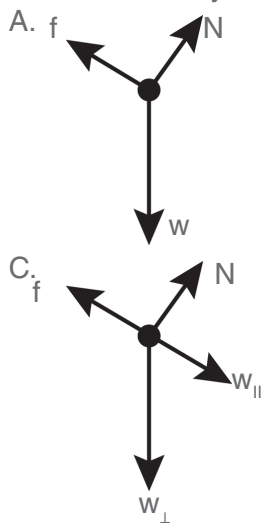
Which vector diagram best represents the magnitude and direction of the change in momentum of the soccer ball?

- A.  B.  C.  D. 



4. A bucket filled with water with a total mass of 2 kg is lifted and then lowered again. Which one of the following changes with respect to the bucket causes a change of 19,6 J in the mechanical energy of the bucket full of water?
- The height increases with 0,1 m at a constant speed of 3 m·s<sup>-1</sup>.
  - The bucket is lifted 0,5 m and lowered 0,5 m.
  - The bucket is lowered at a constant speed of 3 m·s<sup>-1</sup> for a height of 1 m.
  - The speed of the object doubles.

5. Which ONE of the following is the most correct representation of the free force diagram for a person, with weight  $w$ , skiing down a ski slope at a constant velocity?



6. The change in momentum of a golf ball with a mass of 500 g moving towards a hard wall at 0,3 m·s<sup>-1</sup> and then moving away from the wall at 0,2 m·s<sup>-1</sup> is:
- 250 kg·m·s<sup>-1</sup>.
  - 0,25 kg·m·s<sup>-1</sup> towards the wall.
  - 0,05 kg·m·s<sup>-1</sup> away from the wall.
  - 0,25 kg·m·s<sup>-1</sup> away from the wall.

7. The graph represents the velocity-time graph of an object that is thrown upwards from the edge of a building and allowed to fall past the edge of the building to the ground below.

