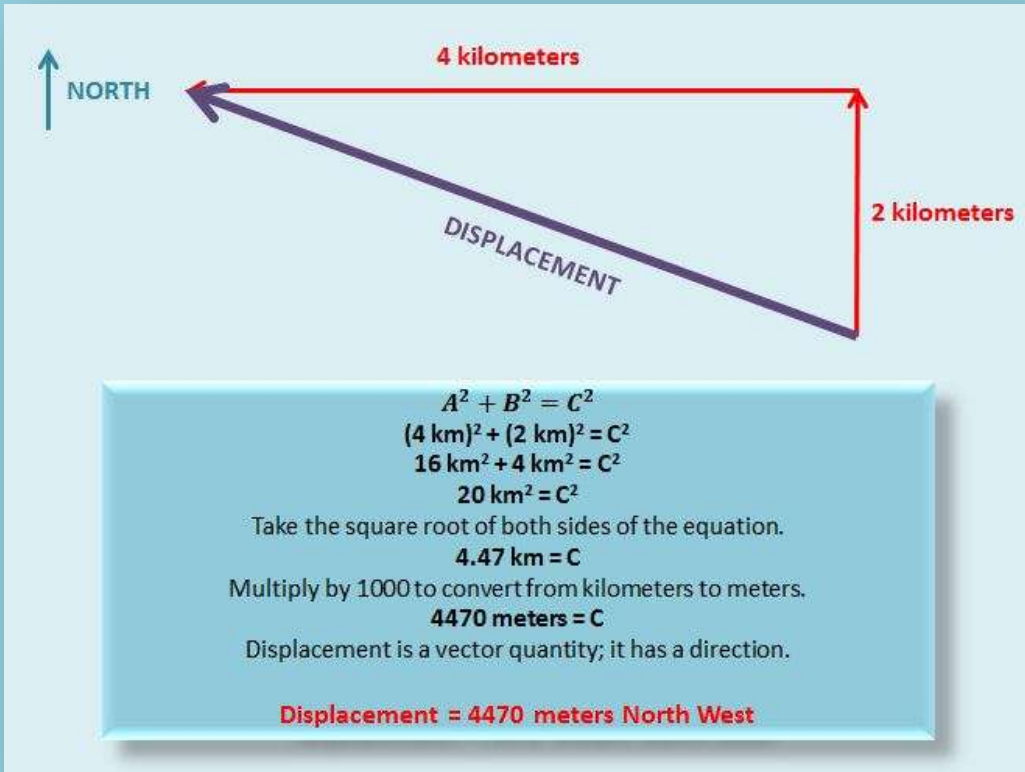


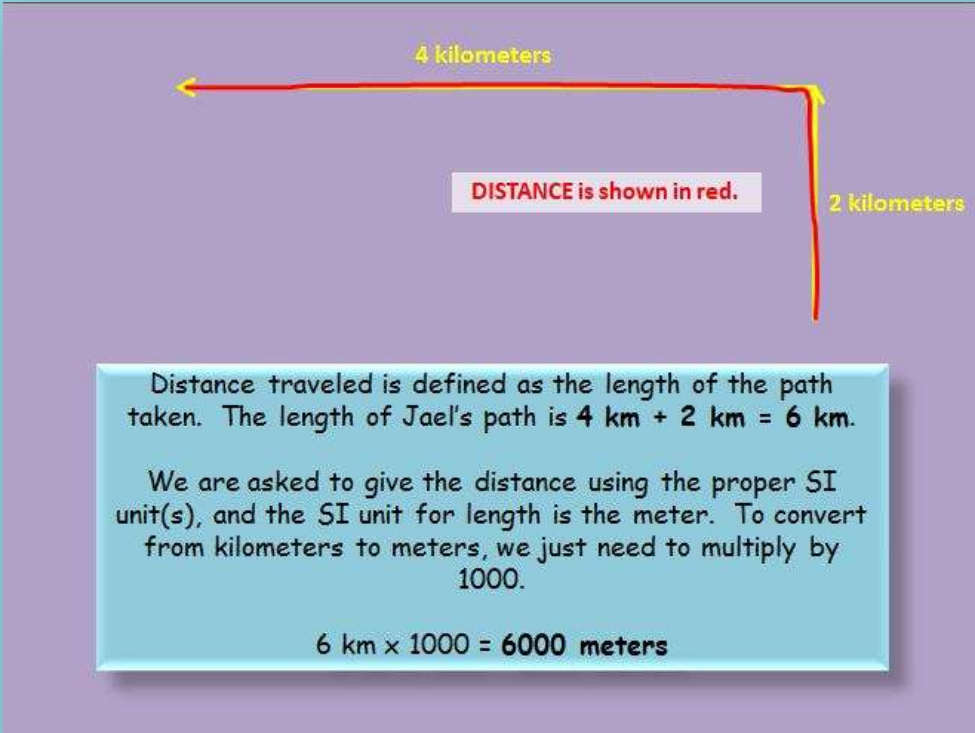
## Distance and Displacement Quiz Solutions

| Question  | Solution and Point Break-Down   |
|---|---|
| <p>What is the <b>displacement</b> of Jael if she walks 2 km north and then turns and walks 4 km west.</p> <p>Please round your answer to two decimal places, and express your answer using the proper SI unit(s). Place the magnitude of your answer in the first blank, and the direction in the second blank. If there is no direction, type "none" in the second blank.</p> | <div style="text-align: center;"> <p>Correct number = .5 points<br/>             Correct unit(s) = .5 points<br/>             Correct direction = .5 points<br/> <b>Total = 1.5 points</b></p> </div> <div style="text-align: center;">  <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%; background-color: #e0f0ff;"> <math display="block">A^2 + B^2 = C^2</math> <math display="block">(4 \text{ km})^2 + (2 \text{ km})^2 = C^2</math> <math display="block">16 \text{ km}^2 + 4 \text{ km}^2 = C^2</math> <math display="block">20 \text{ km}^2 = C^2</math> <p>Take the square root of both sides of the equation.</p> <math display="block">4.47 \text{ km} = C</math> <p>Multiply by 1000 to convert from kilometers to meters.</p> <math display="block">4470 \text{ meters} = C</math> <p>Displacement is a vector quantity; it has a direction.</p> <p style="color: red;"><b>Displacement = 4470 meters North West</b></p> </div> </div> |

What is the **distance** traveled by Jael if she walks 2 km north and then turns and walks 4 km west.

Please express your answer using the proper SI unit(s). Place the magnitude of your answer in the first blank, and the direction in the second blank. If there is no direction, type "none" in the second blank.


Correct number = .5 points  
Correct unit(s) = .5 points  
No direction = .5 points  
**Total = 1.5 points**



What is the **displacement** of Danny if he climbs 10 meters up the side of a building? *Assume the building's sides are vertical.*

Please express your answer using the proper SI unit(s). Place the magnitude of your answer in the first blank, and the direction in the second blank. If there is no direction, type "none" in the second blank.

Correct number = .5 points  
Correct unit(s) = .5 points  
Correct direction = .5 points  
**Total = 1.5 points**



Displacement is defined as change in position. Because displacement is a **vector**, we cannot forget to include a **direction** for Danny's displacement.

**Danny's displacement is 10 meters upward.**

What is the distance traveled by Danny if he climbs 10 meters up the side of a building?

Please express your answer using the proper SI unit(s). Place the magnitude of your answer in the first blank, and the direction in the second blank. If there is no direction, type "none" in the second blank.

Correct number = .5 points

Correct unit(s) = .5 points

No direction = .5 points

**Total = 1.5 points**



Distance = 10 meters


Distance traveled is defined as path length. The length of Danny's path is 10 meters. Because distance is a scalar quantity, no direction is necessary when expressing distance.

**Danny's distance traveled is 10 meters.**

What is the **displacement** of Danny if he climbs 10 meters up the side of a building and repels back to the ground?

Please express your answer using the proper SI unit(s). Place the magnitude of your answer in the first blank, and the direction in the second blank. If there is no direction, type "none" in the second blank.

Correct number = .5 points  
Correct unit(s) = .5 points  
Correct direction = .5 points  
**Total = 1.5 points**



10 meters up + 10 meters back down

Displacement is defined as **change in position**. Danny's displacement is **10 meters up + 10 meters down**. Because the two parts of his displacement are equal in magnitude but opposite in direction, they add up to **zero**. Displacement is a vector quantity, but when a vector is equal to zero, there is **no need for a direction**.

**Danny's displacement is 0 meters.**

What is the **distance** traveled by Danny if he climbs 10 meters up the side of a building and repels back to the ground?

Please express your answer using the proper SI unit(s). Place the magnitude of your answer in the first blank, and the direction in the second blank. If there is no direction, type "none" in the second blank.

Correct number = .5 points  
Correct unit(s) = .5 points  
No direction = .5 points  
**Total = 1.5 points**



10 meters up + 10  
meters back down  
= 20 meters

Distance traveled is defined as the **length of the path** taken. Danny traveled 10 meters up and then 10 meters back down. The length of his path is then **10 meters + 10 meters = 20 meters**. Distance is a scalar quantity. Thus, we do not need to include a direction.

**Danny's distance traveled is 20 meters.**



What is the **displacement** of Jayce if he walks 2 km north, then turns and walks 5 km west, and finally walks 1 km south.

Please round your answer to two decimal places, and express your answer using the proper SI unit(s). Place the magnitude of your answer in the first blank, and the direction in the second blank. If there is no direction, type "none" in the second blank.

Correct number = .5 points  
Correct unit(s) = .25 points  
Correct direction = .25 points  
**Total = 1.0 points**

