

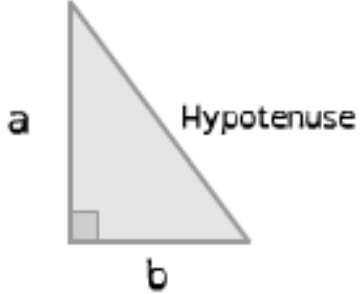
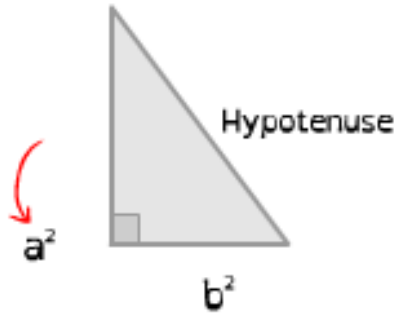


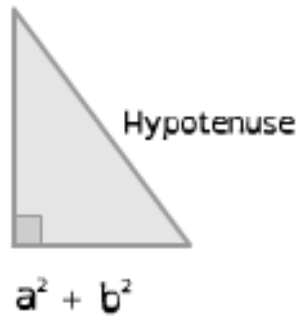
#	SHOT	NARRATOR
1	Applying the Pythagorean Theorem	
2		The Pythagorean Theorem states that the measure

3	 <p>A right-angled triangle with a right angle symbol at the bottom-left corner. The vertical side is labeled "Leg", the horizontal side is labeled "Leg", and the slanted side is labeled "Hypotenuse".</p>	<p>of two legs of a right triangle,</p>
4	 <p>A right-angled triangle with a right angle symbol at the bottom-left corner. The vertical side is labeled "a", the horizontal side is labeled "b", and the slanted side is labeled "Hypotenuse".</p>	<p>squared</p>

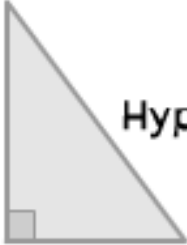
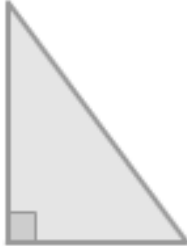
5



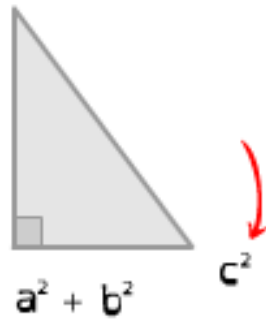
6



and added together,

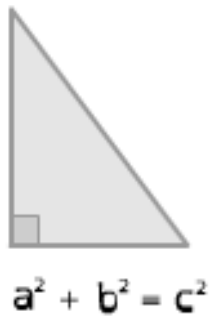
7	 <p>Hypotenuse</p> <p>$a^2 + b^2$</p>	<p>equals the</p>
8	 <p>c^2</p> <p>$a^2 + b^2$</p>	<p>square of</p>

9







the



10





hypotenuse.

11	<p>Applying the Pythagorean Theorem</p> 	<p>The Pythagorean Theorem helps people solve real world problems.</p>
12	 <p>Park</p> <p>Silver Street</p> <p>Canyon Trail</p> <p>Home</p> <p>Maple Avenue</p>	<p>Lucy usually bikes to the park</p>

13	 <p>A map showing a route from Home to Park. The route starts at Home, goes west along Maple Avenue, then north along Silver Street to Park. Canyon Trail is also shown on the map.</p>	<p>along Maple Avenue then</p>
14	 <p>A map showing a route from Home to Park. The route starts at Home, goes west along Maple Avenue, then north along Silver Street to Park. Canyon Trail is also shown on the map.</p>	<p>up Silver Street.</p>

15	 <p>A map showing a right-angled triangle with vertices labeled 'Park' (top), 'Home' (right), and a corner. The vertical leg is labeled 'Silver Street', the horizontal leg is labeled 'Maple Avenue', and the hypotenuse is labeled 'Canyon Trail'. The Canyon Trail is highlighted in blue.</p>	<p>Is Canyon Trail shorter?</p>
16	 <p>A map showing a right-angled triangle with vertices labeled 'Park' (top), 'Home' (right), and a corner. The vertical leg is labeled 'Silver Street', the horizontal leg is labeled 'Maple Avenue', and the hypotenuse is labeled 'Canyon Trail'. All legs are black.</p>	<p>She knows the two legs--</p>

17	 <p>A map showing a triangular route between three points: Park (top), Home (right), and Silver Street (left). The route is highlighted in blue. Canyon Trail is shown as a black line connecting Park and Home. Maple Avenue is shown as a horizontal line connecting Silver Street and Home.</p>	<p>Maple Avenue and Silver Street --</p>
18	 <p>A map showing the same triangular route as in slide 17. The route is highlighted in black. Canyon Trail is shown as a black line connecting Park and Home. Maple Avenue is shown as a horizontal line connecting Silver Street and Home. The number 4 is placed next to Silver Street, and the number 3 is placed below Maple Avenue.</p>	<p>are three and four miles long.</p>

19



Applying the Pythagorean Theorem,

20



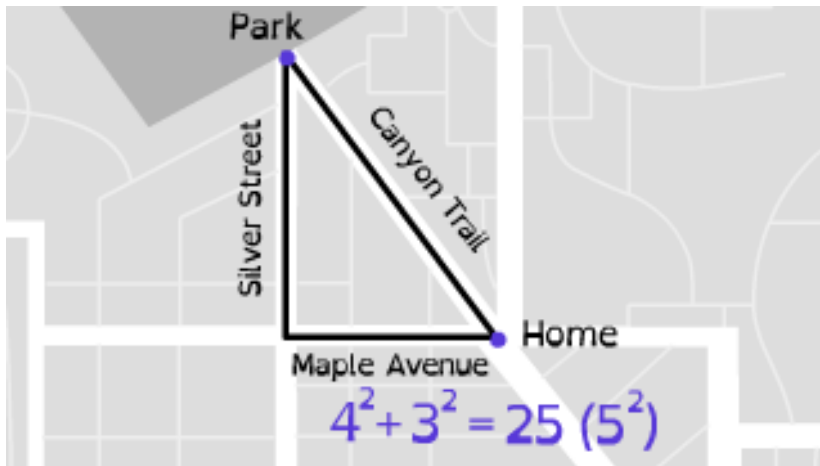
three squared plus four squared

21





equals twenty-five.

22

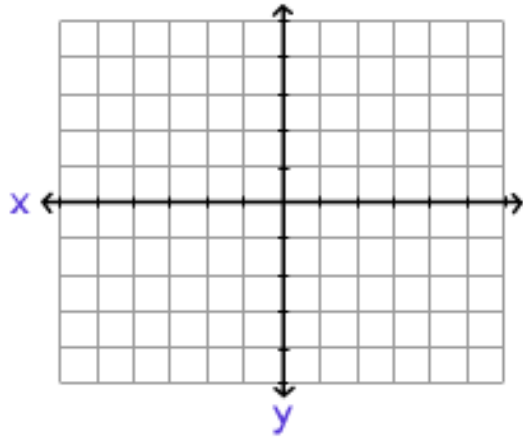


She knows that five squared is twenty-five.

23		<p>So, the hypotenuse--the length of CanyonTrail--</p>
24		<p>is five miles.</p>

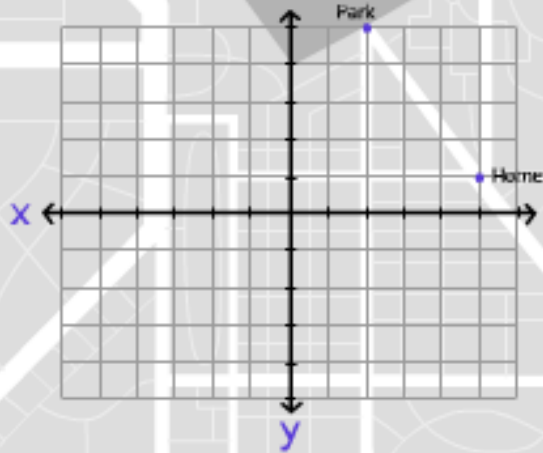
25	<p>7 miles vs. 5 miles</p> 	<p>Two miles less biking for Lucy!</p>
26		<p>What if Lucy doesn't know the lengths of Maple Avenue and Silver Street?</p>

27



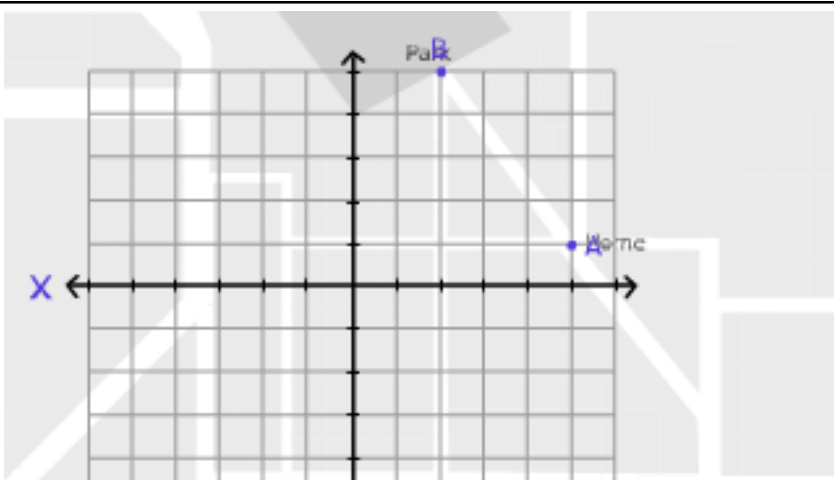
A coordinate plane can help.

28



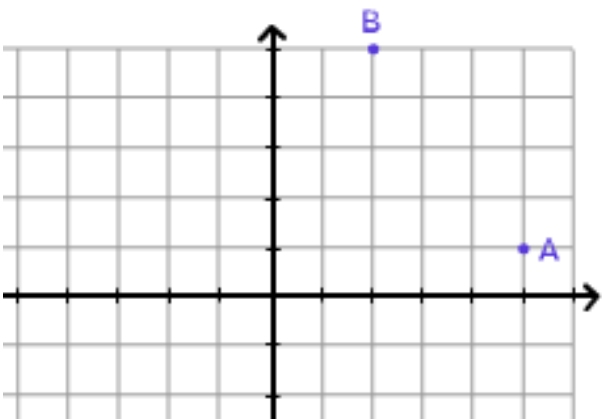
Lucy's House and

29



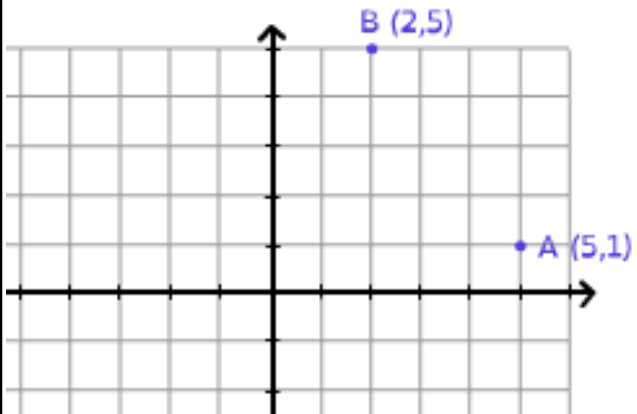
the park can be

30



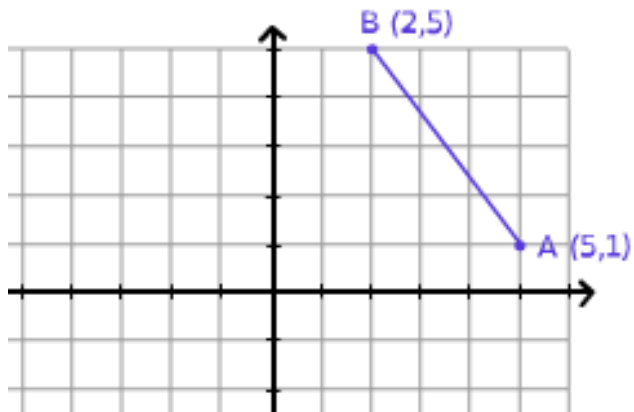
points on the plane.

31



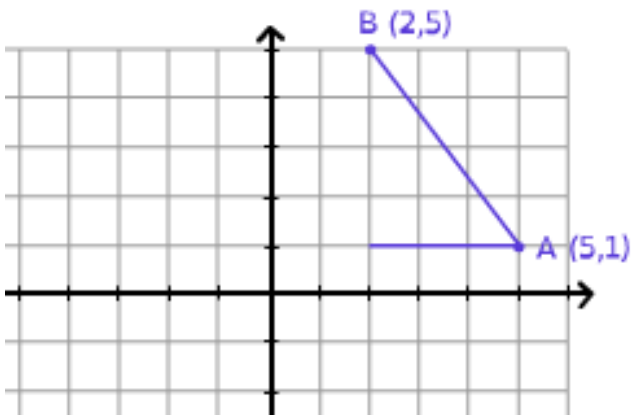
One at five-one and the other at two-five.

32



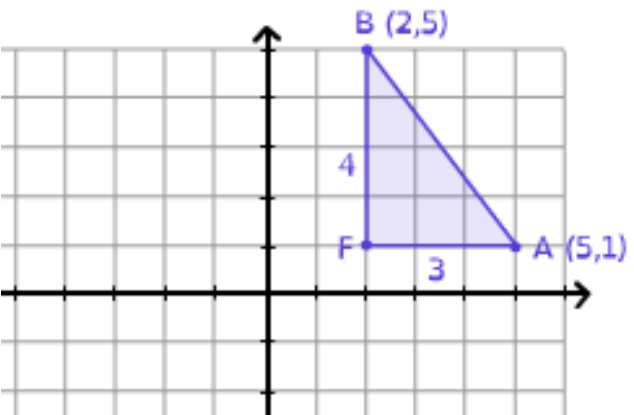
To find the distance between A and B using the Pythagorean Theorem, she needs a right triangle.

33



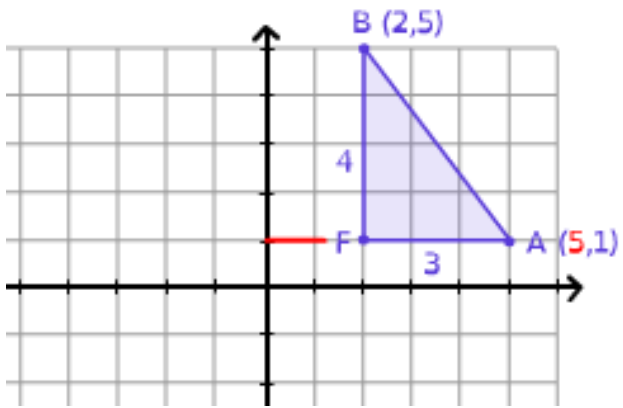
One way to make one is to go three spaces left

34



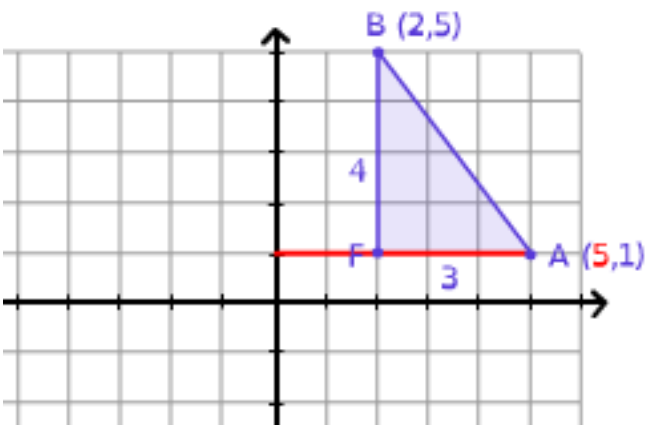
and four spaces up.

35



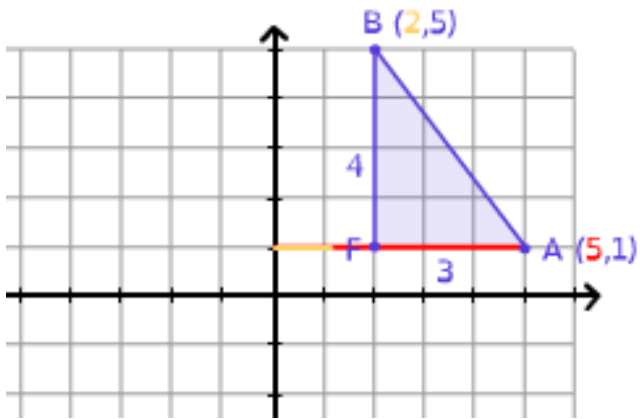
For the horizontal leg,

36



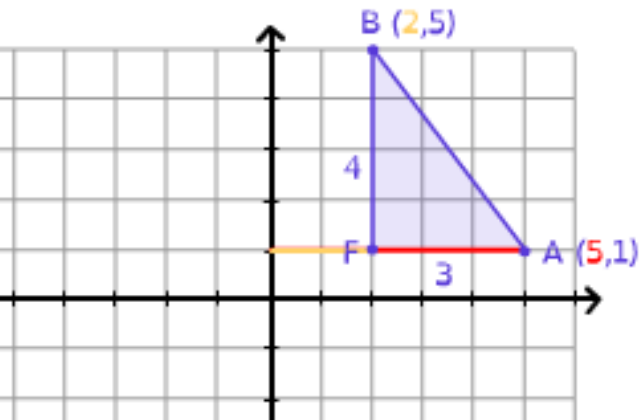
take the x-distance of A

37



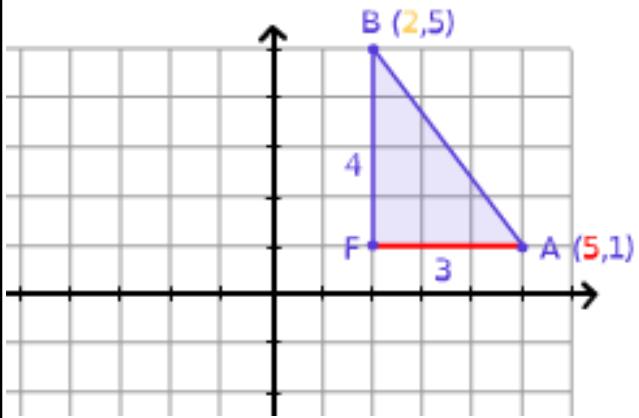
and subtract the

38

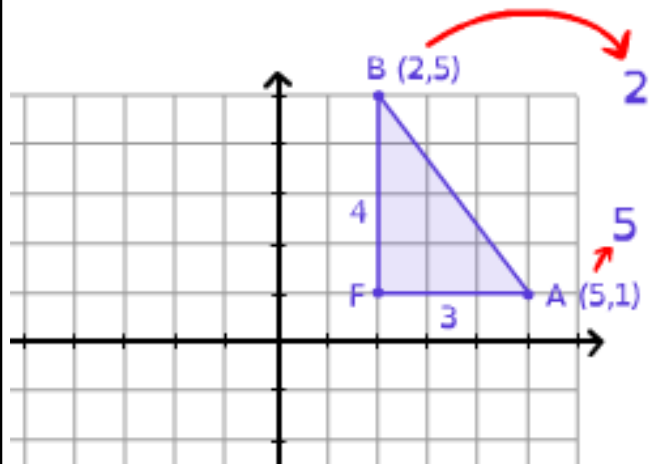


x-distance of B.

39

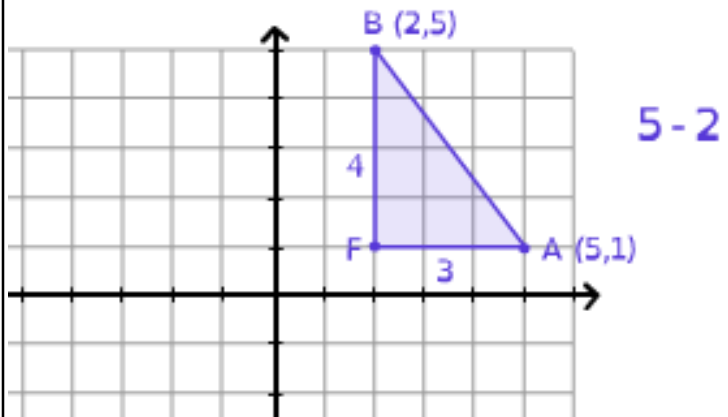


40



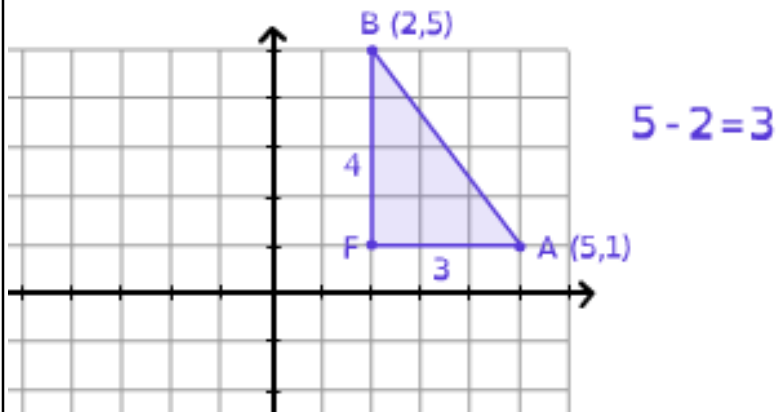
This is equivalent to

41



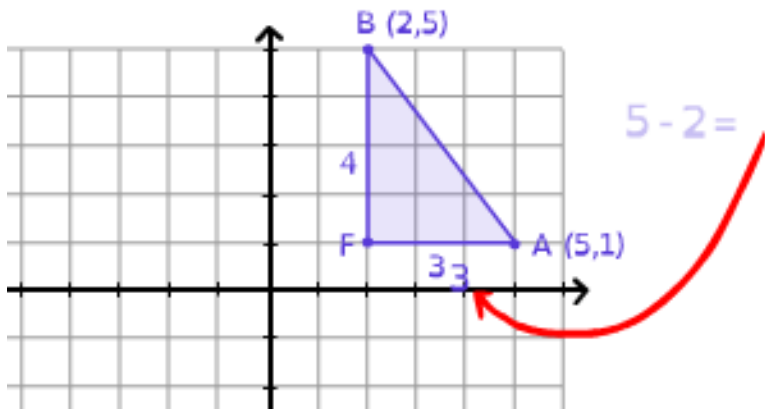
subtracting the x-coordinates

42

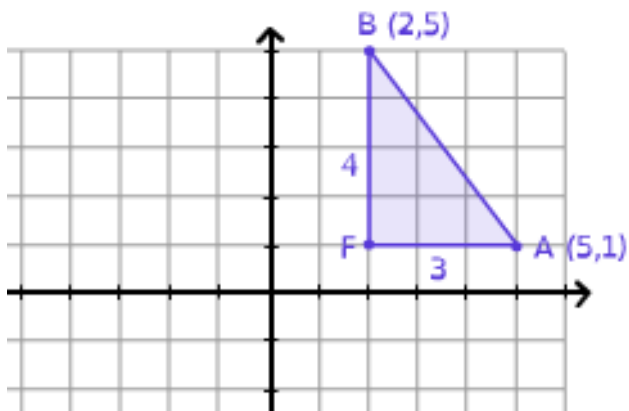


of A and B.

43

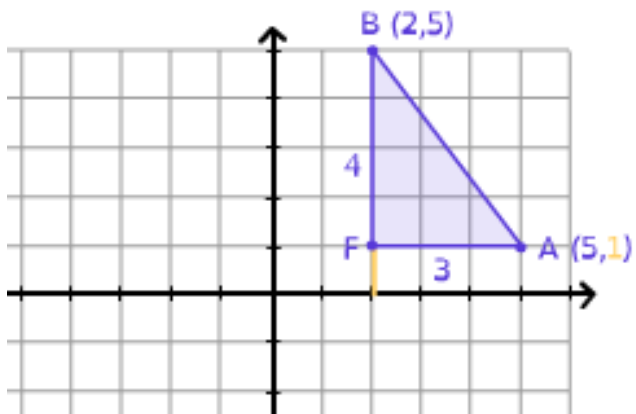


44



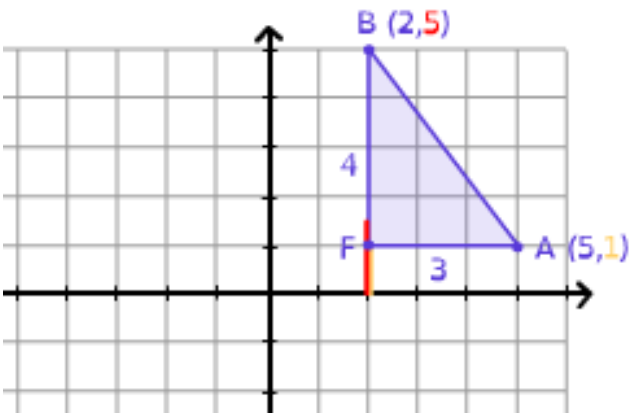
For the vertical leg,

45



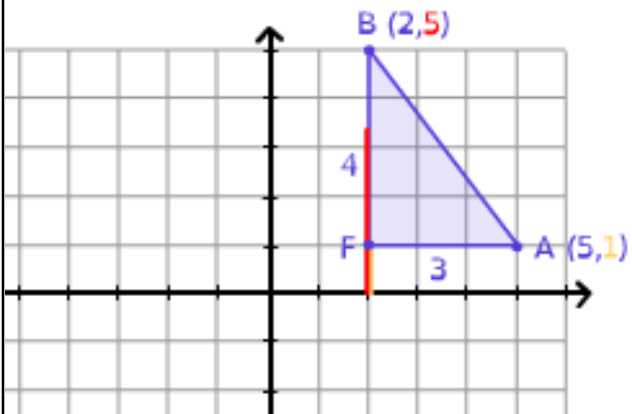
take the y-distance of A

46



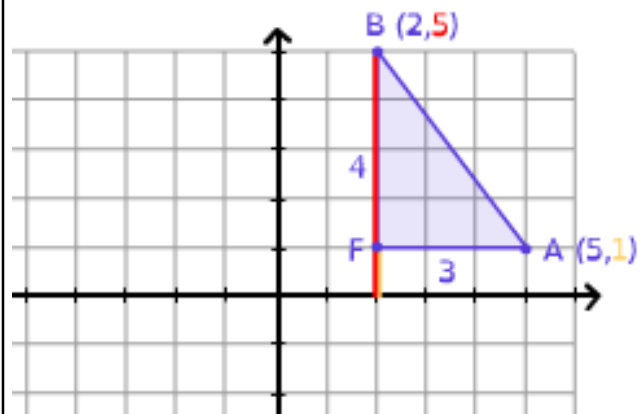
and subtract

47



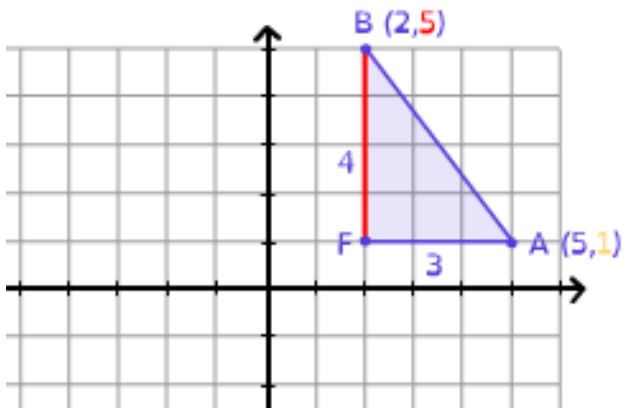
the y-distance

48

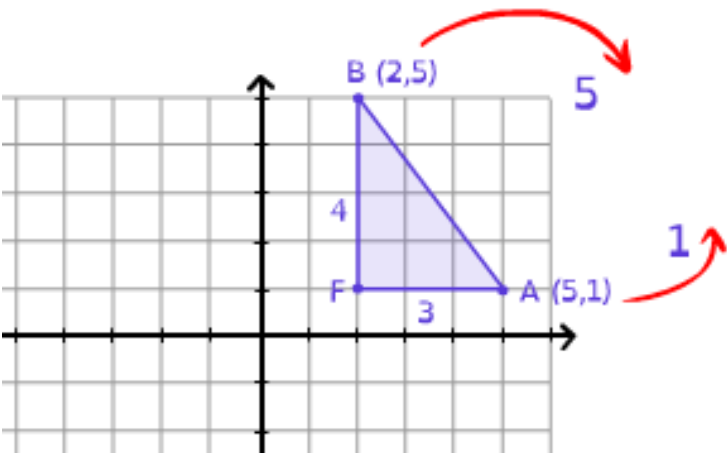


of B.

49

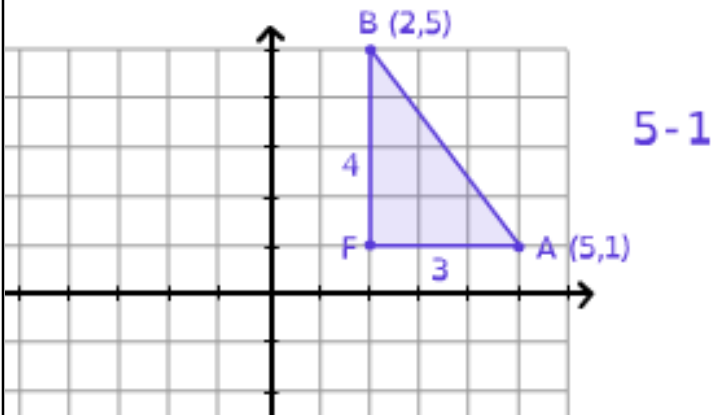


50



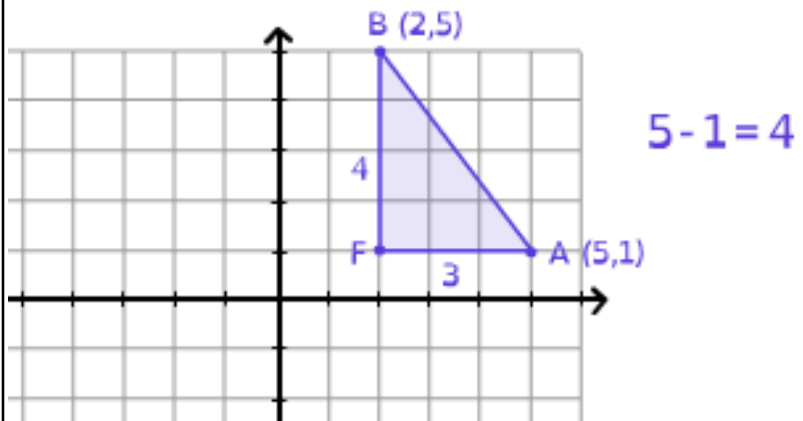
This is equivalent to

51



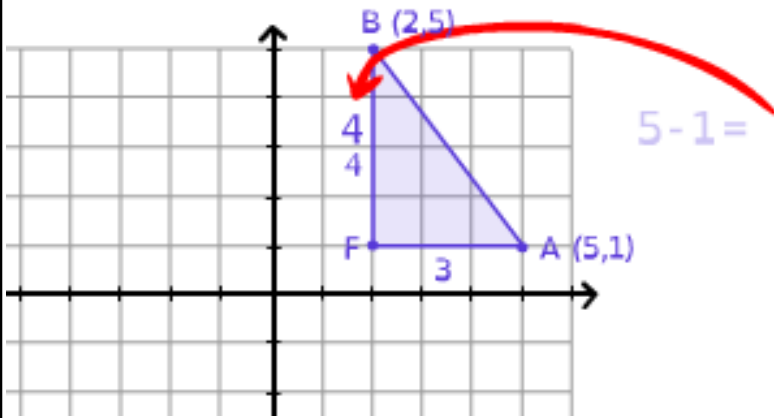
subtracting the y-coordinates

52

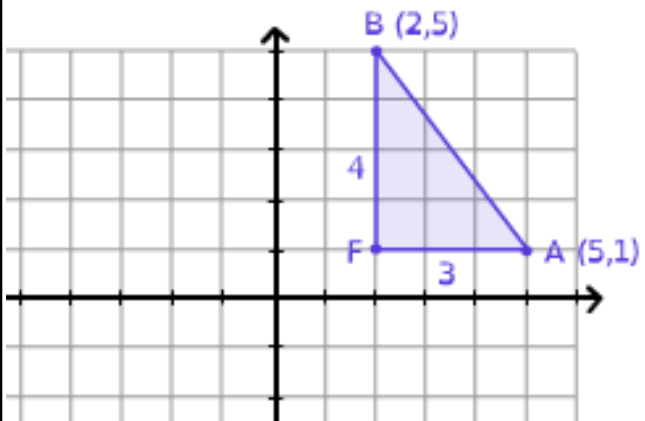


of A and B.

53

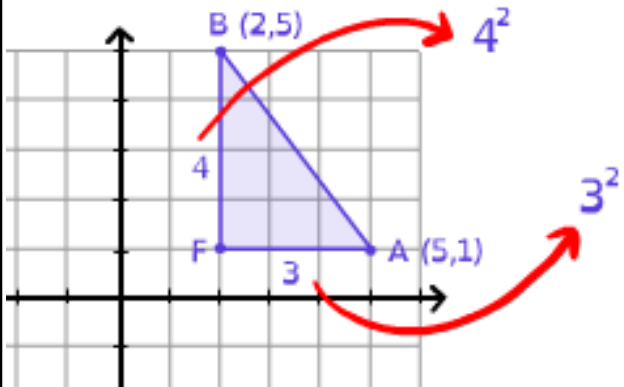


54



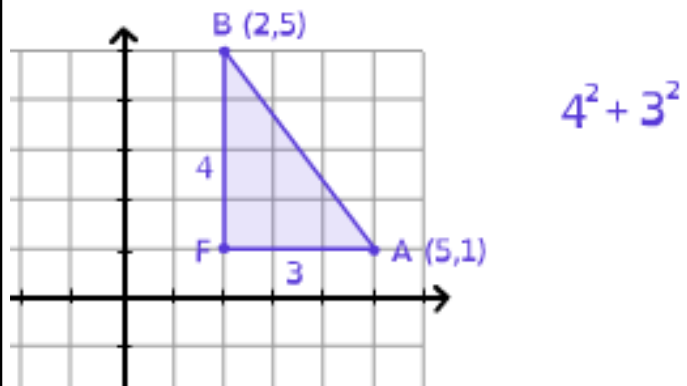
Now

55



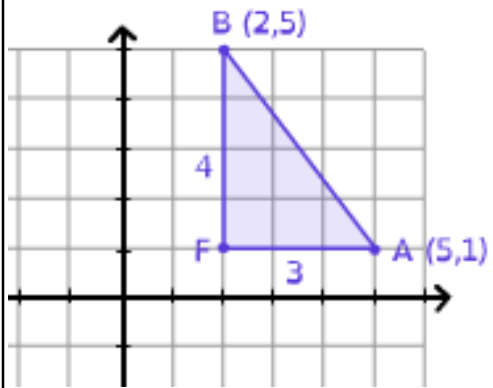
apply the

56



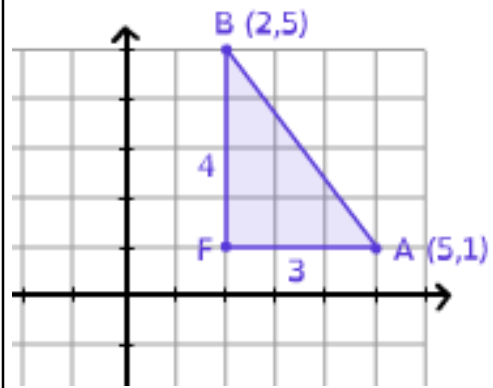
Pythagorean Theorem.

57



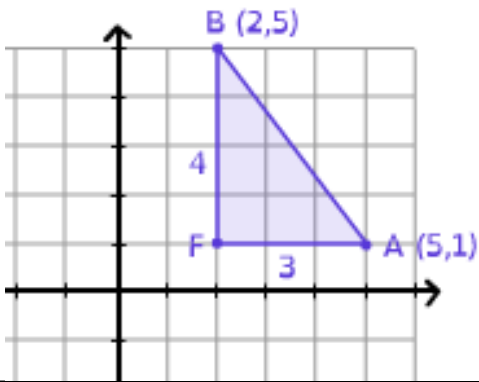
$$4^2 + 3^2$$
$$16 + 9$$

58



$$4^2 + 3^2$$
$$16 + 9$$
$$25$$

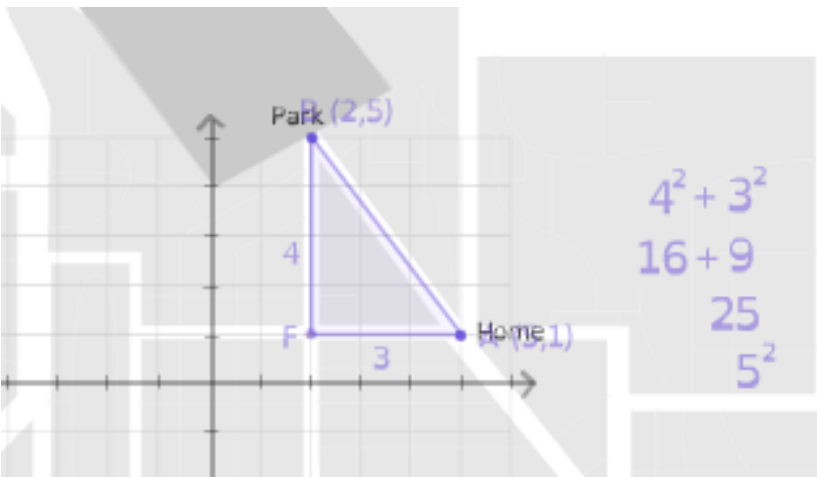
59



$$\begin{aligned}4^2 + 3^2 \\ 16 + 9 \\ 25 \\ 5^2\end{aligned}$$

Again, the length of Canyon Trail is five miles.

60



$$\begin{aligned}4^2 + 3^2 \\ 16 + 9 \\ 25 \\ 5^2\end{aligned}$$

If

61	 <p>A map showing a network of streets. A path is highlighted in white, starting at a blue dot labeled 'Home' on Maple Avenue, going north on Silver Street, and then northeast on Canyon Trail to a blue dot labeled 'Park'. A grey shaded area is in the top left corner.</p>	<p>you can</p>
62	 <p>A map showing a network of streets. A path is highlighted in white, starting at a blue dot labeled 'Home' on Maple Avenue, going north on Canyon Trail, and then west on Silver Street to a blue dot labeled 'Park'. A grey shaded area is in the top left corner.</p>	<p>represent a</p>

63



problem using

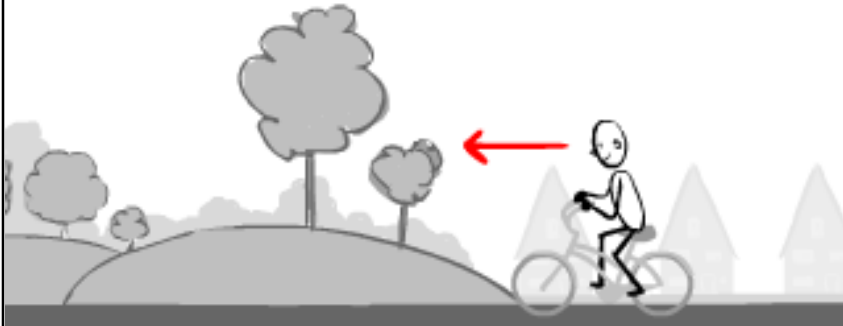
64



a right triangle,

65

Applying the Pythagorean Theorem



the Pythagorean Theorem can help you find several distances at once.