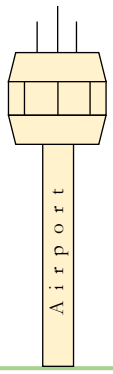
Which plane is closer to the base of the airport tower?



Plane A
Altitude: 20,000 feet

Plane B
Altitude: 8,000 feet

16,000 feet

23,000 feet

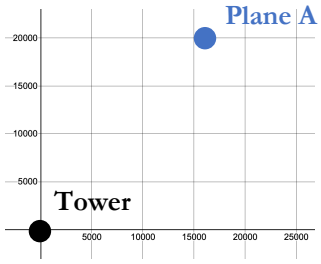
Kaden's "Distance Formula" Method

If I make a graph, I see the base of the tower is at (0, 0) and Plane A is at (16,000, 20,000).

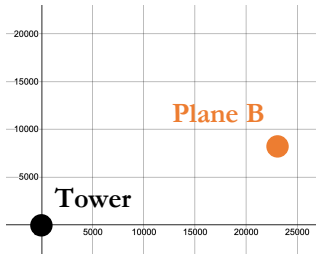
I can use the distance formula to find the distance from Plane A to the tower.

I can also find the distance from Plane B at (23,000, 8,000) to the tower.

Plane B is closer.



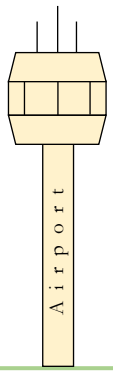
$$d_A = \sqrt{(16{,}000 - 0)^2 + (20{,}000 - 0)^2}$$
$$d_A = \sqrt{256{,}000{,}000 + 400{,}000{,}000}$$
$$d_A = \sqrt{656{,}000{,}000}$$
$$d_A \approx 25{,}612$$



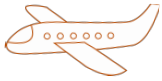
$$d_B = \sqrt{(23{,}000 - 0)^2 + (8{,}000 - 0)^2}$$
$$d_B = \sqrt{529{,}000{,}000 + 64{,}000{,}000}$$
$$d_B = \sqrt{593{,}000{,}000}$$
$$d_B \approx 24{,}351$$

$25{,}612 > 24{,}351$

Which plane is closer to the base of the airport tower?



Plane A
Altitude: 20,000 feet

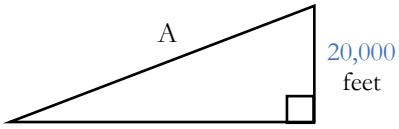


Plane B
Altitude: 8,000 feet

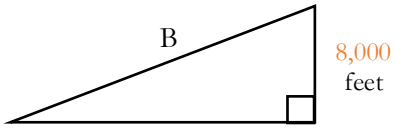
16,000 feet

23,000 feet

Maddie's "Pythagorean Theorem" Method



$$16{,}000^2 + 20{,}000^2 = A^2$$
$$256{,}000{,}000 + 400{,}000{,}000 = A^2$$
$$656{,}000{,}000 = A^2$$
$$25{,}612 \approx A$$



$$23{,}000^2 + 8{,}000^2 = B^2$$
$$529{,}000{,}000 + 64{,}000{,}000 = B^2$$
$$593{,}000{,}000 = B^2$$
$$24{,}351 \approx B$$

I can draw a triangle between the tower, Plane A, and a spot on the ground below Plane A.

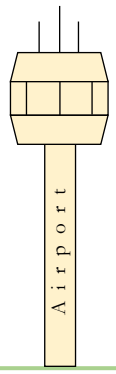
I can use the Pythagorean Theorem to find the distance between Plane A and the tower.

I can do the same thing with Plane B.

Plane B is closer.

$$25{,}612 > 24{,}351$$

Which plane is closer to the base of the airport tower?



Plane A
Altitude: 20,000 feet

Plane B
Altitude: 8,000 feet

16,000 feet

23,000 feet

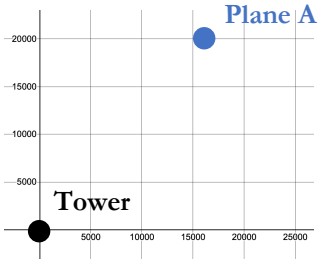
Kaden's "Distance Formula" Method

If I make a graph, I see the base of the tower is at (0, 0) and Plane A is at (16,000, 20,000).

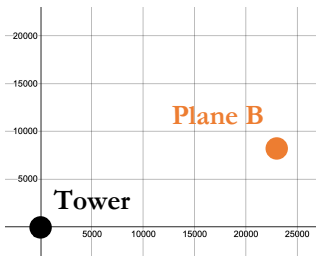
I can use the distance formula to find the distance from Plane A to the tower.

I can also find the distance from Plane B at (23,000, 8,000) to the tower.

Plane B is closer.



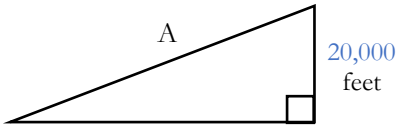
$$d_A = \sqrt{(16{,}000 - 0)^2 + (20{,}000 - 0)^2}$$
$$d_A = \sqrt{256{,}000{,}000 + 400{,}000{,}000}$$
$$d_A = \sqrt{656{,}000{,}000}$$
$$d_A \approx 25{,}612$$



$$d_B = \sqrt{(23{,}000 - 0)^2 + (8{,}000 - 0)^2}$$
$$d_B = \sqrt{529{,}000{,}000 + 64{,}000{,}000}$$
$$d_B = \sqrt{593{,}000{,}000}$$
$$d_B \approx 24{,}351$$

$25{,}612 > 24{,}351$

Maddie's "Pythagorean Theorem" Method



$$16{,}000^2 + 20{,}000^2 = A^2$$
$$256{,}000{,}000 + 400{,}000{,}000 = A^2$$
$$656{,}000{,}000 = A^2$$
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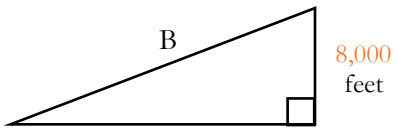


$$23{,}000^2 + 8{,}000^2 = B^2$$
$$529{,}000{,}000 + 64{,}000{,}000 = B^2$$
$$593{,}000{,}000 = B^2$$
$$24{,}351 \approx B$$

$25{,}612 > 24{,}351$

I can draw a triangle between the tower, Plane A, and a spot on the ground below Plane A.

I can use the Pythagorean Theorem to find the distance between Plane A and the tower.

I can do the same thing with Plane B.

Plane B is closer.

P.5: *Apply*

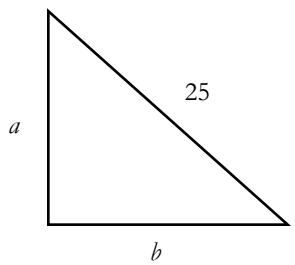
1) What are the similarities and differences between Kaden and Maddie's methods?

Similarities	Differences

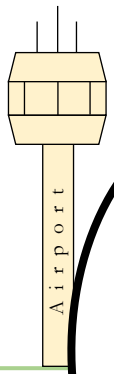
2) Whose method would you rather use? Explain why you chose that method.

3) Given the information in the diagram and that Plane B is 22 km from the base of the airport tower, determine the altitude of Plane B.

4) Given the triangle below, is it possible to find more than one set of lengths for sides *a* and *b*? Explain.



Whic… is clo… e base of the airport tower?



I knew that you could use the Pythagorean Theorem to find distance, but it was interesting to see Maddie use it in a real-world problem like this!

Kaden'…

If I mak… graph, I se… base of the t… is at (0, 0) a… Plane A is at… (16,000, 20,000).

I can use the distance formula to find the distance from Plane A to the tower.

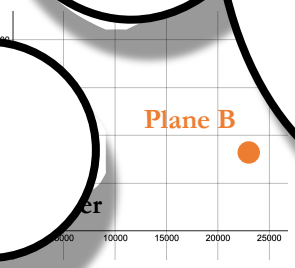
$d_A =$

$d_A =$

$d_A = \sqrt{}$

$d_A \approx 25,$

I can also find the distance from Plane B at (23,000, 8,000) to the tower.



B

…,000 feet

23,000 feet

Plane B is closer.

$d_B = \sqrt{(23{,}000 - 0)^2 + (8{,}000 - 0)^2}$

$d_B = \sqrt{529{,}000{,}000 + 64{,}000{,}000}$

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$24{,}351 \approx B$

$25{,}612 > 24{,}351$

…n …ane …t on …low

…find …nce …n Plane A …nd the tower.

I can do the same thing with Plane B.

Plane B is closer.