

Lunchtime at the Fish Pond

26 June 2024

Jim Stevenson



www.dreamstime.com

This is a problem from the 629 AD work of Bhaskara I, a contemporary of Brahmagupta ([1]).

A fish is resting at the northeast corner of a rectangular pool. A heron standing at the northwest corner spies the fish. When the fish sees the heron looking at him he quickly swims towards the south (in a southwesterly direction rather than due south). When he reaches the south side of the pool, he has the unwelcome surprise of meeting the heron who has calmly walked due south along the side and turned at the southwest corner of the pool and proceeded due east, to arrive simultaneously with the fish on the south side. Given that the pool measures 12 units by 6 units, and that the heron

walks as quickly as the fish swims, find the distance the fish swam.

Solution

Let d be the distance the fish swam and x the distance reached by the fish along the south side of the pond measured from the right side. Then the distance the heron walked is $18 - x$, the same distance the fish swam. So

$$18 - x = d$$

So $d^2 = x^2 + 6^2 = (18 - d)^2 + 6^2$

or $2 \cdot 18d = 18^2 + 6^2 = 6^2(9 + 1)$

or $6^2d = 6^2 \cdot 10$

or $d = 10$ units,

which is what we wanted to find.

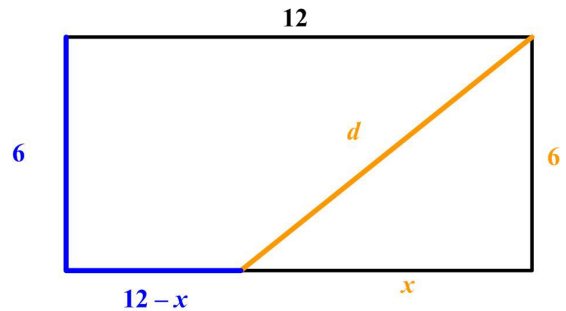


Figure 1

References

- [1] "Lunchtime at the Fish Pond," *Convergence*, Mathematical Association of America, August 2007. From *Āryabhaṭīyabhāṣya (Commentary on Aryabhata's Work)*, Bhaskara I, 629 AD (New link: <https://old.maa.org/press/periodicals/convergence/lunchtime-at-the-fish-pond>).

© 2024 James Stevenson