



Applying Pythagoras' Theory to 3D representations

Mana Maths

Te reo Māori terms



ture a Pythagoras

Pythagoras' theorem

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**poro-tapawhā
hāngai**

rectangular prism

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tapatoru

triangle

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koi

vertex

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Applying Pythagoras' Theory to 3D representations — Foundation

1. A cuboid is 6 cm long, 4 cm wide, and 3 cm high. Find the diagonal across the base.
2. A cuboid is 8 m long, 6 m wide, and 2 m high. Find the diagonal across the base to 1 decimal place.
3. A cuboid is 9 cm long, 12 cm wide, and 5 cm high. Find the diagonal across the base.
4. A box is 5 cm long, 12 cm high, and 4 cm deep. Find the diagonal across the front face.
5. A room is 3 m wide, 4 m high, and 5 m long. Find the diagonal across the 3 m by 4 m wall.
6. A prism is 7 cm long, 24 cm high, and 10 cm deep. Find the diagonal across the front face.

- 7.** A cuboid is 6 cm long, 8 cm wide, and 2 cm high. Find the space diagonal to 1 decimal place.
- 8.** A cuboid is 9 m long, 12 m wide, and 4 m high. Find the space diagonal to 1 decimal place.
- 9.** A cuboid is 3 cm long, 4 cm wide, and 12 cm high. Find the space diagonal.
- 10.** A fish tank is 8 cm by 15 cm by 4 cm. Find the longest inside diagonal to 1 decimal place.
- 11.** A storage box is 5 cm by 12 cm by 13 cm. Find the longest inside diagonal to 1 decimal place.
- 12.** A cabinet is 1.2 m by 1.6 m by 2.0 m. Find the longest inside diagonal to 1 decimal place.
- 13.** A cuboid has base edges 5 cm and 12 cm, and height 9 cm. Find the base diagonal first, then the space diagonal.
- 14.** A gift box is 9 cm by 12 cm by 20 cm. Which is longer: a face diagonal or the full space diagonal?

Applying Pythagoras' Theory to 3D representations — Proficient

1. A cuboid is 8 cm by 6 cm by 24 cm. Find the space diagonal to 1 decimal place.
2. A cuboid is 10 m by 24 m by 7 m. Find the space diagonal to 1 decimal place.
3. A cuboid is 9 cm by 12 cm by 20 cm. Find the space diagonal exactly if possible.
4. A room is 4 m wide, 3 m high, and 12 m long. Find the distance from one floor corner to the opposite ceiling corner.
5. A crate is 5 cm by 12 cm by 84 cm. Find its longest inside diagonal.
6. A cuboid has base diagonal 15 cm and height 8 cm. Find the space diagonal.

- 7.** The space diagonal of a cuboid is 13 cm. Its height is 12 cm and its depth is 4 cm. Find the length.
- 8.** The space diagonal of a box is 17 cm. Its length is 8 cm and its depth is 15 cm. Find the height.
- 9.** A cuboid is 6 cm high and has a square base. The space diagonal is 11 cm. Find the side length of the base to 1 decimal place.
- 10.** A tunnel frame is 9 m wide and 12 m high. A support runs across that rectangular face. Find the support length.
- 11.** A shipping box is 30 cm by 40 cm by 120 cm. Can a 130 cm rod fit exactly along the inside diagonal? Explain.
- 12.** A cuboid has dimensions 2.4 m, 3.2 m, and 6 m. Find the longest inside diagonal to 1 decimal place.

Applying Pythagoras' Theory to 3D representations — Excellence

1. A cuboid is 6 cm by 8 cm by 24 cm. Find the space diagonal exactly.
2. A cuboid is 9 cm by 12 cm by 12 cm. Find the space diagonal exactly.
3. A cuboid is 5 cm by 12 cm by 20 cm. Find the space diagonal to 1 decimal place.
4. A room is 2.5 m wide, 6 m long, and 2.4 m high. Find the longest straight-line distance corner to corner.
5. A cuboid has a square base of side 10 cm. Its space diagonal is 18 cm. Find the height to 1 decimal place.
6. The space diagonal of a cuboid is 41 cm. Two edges are 9 cm and 12 cm. Find the third edge.

- 7.** A box is 15 cm long and 8 cm deep. Its longest inside diagonal is 20 cm. Find the height to 1 decimal place.
- 8.** A package measures 20 cm by 21 cm by 48 cm. Will a 56 cm stick fit inside it? Justify your answer.
- 9.** A cuboid has dimensions x cm, x cm, and 24 cm. Its space diagonal is 26 cm. Find x .
- 10.** A display case is 30 cm by 40 cm by 90 cm. Find the shortest whole-number rod that will reach from one corner to the opposite corner.
- 11.** A cuboid has base diagonal 25 cm and height 24 cm. Find the space diagonal. State whether it is a whole number.
- 12.** A storage crate is 1.8 m by 2.4 m by 6 m. Find the longest inside diagonal exactly in surd form, then to 1 decimal place.

- 13.** A cuboid has side lengths in the ratio $3 : 4 : 12$. The shortest side is 5 cm. Find the space diagonal to 1 decimal place.
- 14.** A rectangular prism has width 9 cm. The face diagonal across width and height is 15 cm, and the full space diagonal is 36 cm. Find the length.
- 15.** A cuboid has integer side lengths and space diagonal 17 cm. One edge is 8 cm and another is 15 cm. Find the third edge and say what is special.
- 16.** A builder wants a brace across a box frame measuring 12 dm by 16 dm by 21 dm. Find the brace length to 1 decimal place.