**Logo, icon

Description automatically generatedFX Library Modules**

**Pythagoras**

Age 13-15

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**Question**

Find the length of the hypotenuse for each of these triangles.

1. b)

<EFOFEX>
id:fxd{de2256e6-40e3-41d0-8de3-3200fdc07123}
FXGP:DP-dHW5c8Z
FXData:

</EFOFEX> <EFOFEX>
id:fxd{4c711bc3-43f5-4d7d-ab35-dfb2d9dfa2b8}
FXGP:DP-sL4XVbR
FXData:

</EFOFEX>

**Solution**

1. <EFOFEX>
   id:fxe{b50c902d-daf4-4624-9cb4-6c4015836a58}
   FXGP:DP-dHW5c8Z
   FXData:

   </EFOFEX> b) <EFOFEX>
   id:fxe{3abdf084-58b5-4911-a672-4b4a0db6159e}
   FXGP:DP-sL4XVbR
   FXData:

   </EFOFEX>

**Notes**

Multiples of Pythagorean triples 3,4,5 and 5,12,13. Part a has 8 variations. Part b has 9 variations.

**Question**

Find the length of the hypotenuse for each of these triangles correct to two decimal places.

a) b)

<EFOFEX>
id:fxd{d3e93d72-f4a3-4c90-a65a-a62d7b34ac46}
FXGP:DP-fSb4NHN
FXData:

</EFOFEX> <EFOFEX>
id:fxd{1975267b-b7e3-4cba-9008-17479eb6424e}
FXGP:DP-3P3efxs
FXData:

</EFOFEX>

**Solution**

1. <EFOFEX>
   id:fxe{de364f4c-baaa-4ebd-88eb-53ab52824be1}
   FXGP:DP-fSb4NHN
   FXData:

   </EFOFEX> b) <EFOFEX>
   id:fxe{24e1ede8-1587-4811-b592-647b3be330bc}
   FXGP:DP-3P3efxs
   FXData:

   </EFOFEX>

**Notes**

Part a has 1000+ variations. Part b has 2000+ variations.

**Question**

Find the length of the unknown side (in metres, correct to 2d.p.)

<EFOFEX>
id:fxd{226b819a-6b72-4859-8340-87456acc6879}
FXGP:DP-BaX5VVT
FXData:

</EFOFEX>

**Solution**

<EFOFEX>
id:fxe{cf30d9fb-1c5e-4fd8-96f0-fa15c259797d}
FXGP:DP-BaX5VVT
FXData:

</EFOFEX>

**Notes**

500+ variations

**Question**

Find the length of the unknown side (in centimetres to the nearest centimetre.)

<EFOFEX>
id:fxd{f1cda501-20dc-4e47-acb8-280c2b0ba138}
FXGP:DP-u5QusAp
FXData:

</EFOFEX>

**Solution**

<EFOFEX>
id:fxe{976e31c4-3243-400e-a252-e7c6a3f3691e}
FXGP:DP-u5QusAp
FXData:

</EFOFEX>

**Notes**

1000+ variations

**Question**

Find the length of the unknown side (in metres to the nearest metre.)

<EFOFEX>
id:fxd{4d0d3e10-d4af-4f00-a523-bd68e960b674}
FXGP:DP-fxZgZ5S
FXData:

</EFOFEX>

**Solution**

<EFOFEX>
id:fxe{fcef0a5f-5704-499d-9dc0-9e46f3eebb9e}
FXGP:DP-fxZgZ5S
FXData:

</EFOFEX>

**Notes**

5000+ variations

**Question**

Calculate the perimeter of this triangle (correct to 2dp).

<EFOFEX>
id:fxd{124bb2f2-a9b8-44af-98b7-0f62ae57ebca}
FXGP:DP-9FsjBaY
FXData:

</EFOFEX>

**Solution**

<EFOFEX>
id:fxe{e0be9e2a-d24a-4df5-9e74-51adc0d489ea}
FXGP:DP-9FsjBaY
FXData:

</EFOFEX>

**Notes**

5000+ variations

**Question**

Calculate the perimeter of this triangle (correct to 2dp).

<EFOFEX>
id:fxd{59f74cc8-1662-488e-9779-5fc2c24c55db}
FXGP:DP-jtG2qDZ
FXData:

</EFOFEX>

**Solution**

<EFOFEX>
id:fxe{c4ee917f-c53a-4d0f-8a32-9f7472699396}
FXGP:DP-jtG2qDZ
FXData:

</EFOFEX>

**Notes**

300+ variations

**Question**

Find the perimeter of this triangle.

<EFOFEX>
id:fxd{e1488898-9260-401f-b535-22f4dd932019}
FXGP:DP-BFG76nE
FXData:

</EFOFEX>

**Solution**

<EFOFEX>
id:fxe{10879556-eb7d-4a9a-ae70-2e2a33ac771c}
FXGP:DP-BFG76nE
FXData:

</EFOFEX>

**Notes**

300+ variations

**Question**

A roof carpenter has built a truss for a roof as shown below. The truss is <EFOFEX>
id:fxe{fc5aee41-cd84-4099-bf88-ed83c049efe6}
FXGP:DP-A4wwt9C
FXData:

</EFOFEX>m wide and <EFOFEX>
id:fxe{6b089640-a3c6-4272-8ff5-0a32b3bc934f}
FXGP:DP-A4wwt9C
FXData:

</EFOFEX>m tall. They how need to order metal for the roof which will need to be at least as long as the side marked x in the diagram.

<EFOFEX>
id:fxd{828e92a2-6aee-471d-9c7a-f3e851513881}
FXGP:DP-A4wwt9C
FXData:

</EFOFEX>

How long will the metal need to be?

**Solution**

<EFOFEX>
id:fxd{e0a2783a-f716-4184-8287-740509e26434}
FXGP:DP-A4wwt9C
FXData:

</EFOFEX>

<EFOFEX>
id:fxe{1d160198-106a-4c98-814b-d7b081f53546}
FXGP:DP-A4wwt9C
FXData:

</EFOFEX>

**Notes**

200+ variations

**<EFOFEX>
id:fxd{92cc2068-c579-4f63-8da5-ecc06a36bfc5}
FXGP:DP-Syvhx5T
FXData:
</EFOFEX>Question**

A <EFOFEX>
id:fxe{a0652ac8-f609-4fa0-92e9-1931a279a2d1}
FXGP:DP-Syvhx5T
FXData:

</EFOFEX> ladder is leaning against a wall. The base of the ladder is <EFOFEX>
id:fxe{2df77c06-54f1-4c94-be06-ed913d5eeb04}
FXGP:DP-Syvhx5T
FXData:

</EFOFEX> from the wall. How far up the wall does the ladder reach?

**Solution**

<EFOFEX>
id:fxe{75872033-b04b-42aa-a879-1252af9ba0b7}
FXGP:DP-Syvhx5T
FXData:

</EFOFEX>

**Notes**

100+ variations

**Question**

TV screens are traditionally measured along the diagonal of the screen, in inches. We will perform our calculations in centimetres.

<EFOFEX>
id:fxd{1bc90edb-d383-4da8-bf67-ca62b8fb5262}
FXGP:DP-fEcLyLh
FXData:

</EFOFEX>

All modern televisions are produced with a 16:9 aspect ratio. This means that if the width of the screen is divided into 16 equal parts, the height of the screen should be 9 of those parts.

The width you have available for a TV screen is <EFOFEX>
id:fxe{d060a9bf-e94d-4fba-a8d5-ad4ba951968d}
FXGP:DP-fEcLyLh
FXData:

</EFOFEX>. Determine if a <EFOFEX>
id:fxe{d48faa22-2dfe-408d-a564-ae8997d94651}
FXGP:DP-fEcLyLh
FXData:

</EFOFEX> screen is too wide for the space. Show your working.

**Solution**

<EFOFEX>
id:fxd{1e3ef0ba-c04c-4174-a1fa-0b925cd9b347}
FXGP:DP-fEcLyLh
FXData:

</EFOFEX>

<EFOFEX>
id:fxe{0cc6dec5-3a58-4ed6-ac20-49216a6d98c0}
FXGP:DP-fEcLyLh
FXData:

</EFOFEX>

**Notes**

14 variations

**Question**

Find the value of x.

<EFOFEX>
id:fxd{8f7ae7e6-4a13-4d1f-b236-3bdc988b96d4}
FXGP:DP-vSX4vy5
FXData:

</EFOFEX>

**Solution**

<EFOFEX>
id:fxd{0c80025d-a2bf-4746-b647-11a163b1efb6}
FXGP:DP-vSX4vy5
FXData:

</EFOFEX>

<EFOFEX>
id:fxe{8c009fcc-3811-484a-94a2-a7f6edd7f43c}
FXGP:DP-vSX4vy5
FXData:

</EFOFEX>

**Notes**

200+ variations

**Question**

<EFOFEX>
id:fxd{63f93725-9419-4235-9f99-76526b7e46a4}
FXGP:DP-s8aq5tp
FXData:

</EFOFEX>

The distance from a point on the ground to the base of a tree is <EFOFEX>
id:fxe{3e680b5f-f466-48d8-a643-c899d2d0111d}
FXGP:DP-s8aq5tp
FXData:

</EFOFEX>. The distance from the same point to the top of the tree is <EFOFEX>
id:fxe{02ad79a9-3ecc-4922-b811-283520404739}
FXGP:DP-s8aq5tp
FXData:

</EFOFEX>. How tall is the tree?

**Solution**

<EFOFEX>
id:fxd{1897e38b-7eeb-4448-93c9-40b953ff245b}
FXGP:DP-s8aq5tp
FXData:

</EFOFEX>

<EFOFEX>
id:fxe{d3c09c04-68b0-44f8-834c-c1b290f14be1}
FXGP:DP-s8aq5tp
FXData:

</EFOFEX>

**Notes**

Any relevant information. Often useful to indicate if the question has integer solutions. Number of variations can go here.

**Question**

<EFOFEX>
id:fxd{2166c540-010d-48de-98d4-aee15122fae9}
FXGP:DP-s4d3uHb
FXData:
</EFOFEX>A cable is required to join two buildings which are <EFOFEX>
id:fxe{70d9ee4f-8416-489d-9898-7442b6904d5c}
FXGP:DP-s4d3uHb
FXData:

</EFOFEX> apart as shown in the diagram. The shorter building is <EFOFEX>
id:fxe{22dc5572-05fa-46c5-a8ed-1f3c1f79ef1c}
FXGP:DP-s4d3uHb
FXData:

</EFOFEX> tall and the taller building is <EFOFEX>
id:fxe{14b8bca1-7212-446b-9d48-6beb00e3cf76}
FXGP:DP-s4d3uHb
FXData:

</EFOFEX> tall. How long does the cable need to be?

**Solution**

<EFOFEX>
id:fxe{e5bc2420-6b48-4667-bdfc-ce41ef6b603a}
FXGP:DP-s4d3uHb
FXData:

</EFOFEX>

**Notes**

1000+ variations.

**Question**

Two towers are spaced <EFOFEX>
id:fxe{3304fbec-6437-427d-80f2-16a8c88f4abf}
FXGP:DP-tnHYGZh
FXData:

</EFOFEX> apart and a <EFOFEX>
id:fxe{e6f3fd53-6674-43c8-8e8e-9a2c1afa5f5b}
FXGP:DP-tnHYGZh
FXData:

</EFOFEX> cable joins the top of the two towers. If the shorter tower is <EFOFEX>
id:fxe{e4bff240-730b-4345-93ca-a354df62429a}
FXGP:DP-tnHYGZh
FXData:

</EFOFEX> tall, how high is the taller tower?

**Solution**

<EFOFEX>
id:fxd{6575e7fc-b5f4-40bf-ada2-d459f710eba0}
FXGP:DP-tnHYGZh
FXData:

</EFOFEX>

<EFOFEX>
id:fxe{cc8b0493-f365-4b0a-b355-25685bbb582a}
FXGP:DP-tnHYGZh
FXData:

</EFOFEX>

**Notes**

400 000+ variations

**Question**

<EFOFEX>
id:fxd{c0045436-d05f-44bd-9809-d94884fd87e2}
FXGP:DP-5yJvUCR
FXData:

</EFOFEX>

A tower has two supporting cables which are <EFOFEX>
id:fxe{148a9932-2449-42dd-bf06-fbf2a4d3eb88}
FXGP:DP-5yJvUCR
FXData:

</EFOFEX> and <EFOFEX>
id:fxe{8ba4b7e4-92bc-4d69-a86a-a5da12508592}
FXGP:DP-5yJvUCR
FXData:

</EFOFEX> long. If you measure the distance from the base of the tower to the end of the longer cable, it is exactly twice the distance as the shorter cable. How tall is the tower?

**Solution**

<EFOFEX>
id:fxe{71ad9929-3570-4b63-bb32-ef6f9c61d3e1}
FXGP:DP-5yJvUCR
FXData:

</EFOFEX>

**Notes**

Challenge question involving use of simultaneous equations. 5000+ variations