<EFOFEX>
id:fxd{02e02ebc-e5a9-42aa-89ae-d19f8080f354}
FXGP:DP-KUMVDM5
FXData:
</EFOFEX>Right Angle Trigonometry – Challenge Questions

1. The two triangles below have the same area. How large is angle CAD?

2. This time, the two triangles have the same PERIMETER. Again, how large is angle CAD?

<EFOFEX>
id:fxd{5bc63d8a-6d85-4493-81d7-bc2d7a4c393a}

FXData:
</EFOFEX>

3. This triangle has been divided so that the area of the blue (right) side is <EFOFEX>
id:fxe{9f9c68aa-c42a-4d0f-9091-d88ec6f4ea22}

FXData:

</EFOFEX> times the area of the red (left) side. What are the angles of triangle ABC?

4. A cone is produced by removing a quarter of a circle and joining the two edges. When you look at the code from the side, what angle is formed by the two sloping sides?

<EFOFEX>
id:fxd{905bc067-a07f-4b93-b393-ca2094b59ab5}

FXData:
</EFOFEX>

<EFOFEX>
id:fxd{2d2f93ec-7423-4b7c-af0f-7d247a380ceb}
FXGP:DP-LGA439R
FXData:
</EFOFEX>5. A kitchen supply company is designing a new edge-moulding for benchtops that has this design.

All distances are in millimetres. You can assume that the straight edges are tangential to the rounded corner. Find the size of angle x.

Right Angle Trigonometry – Challenge Questions - Answers

1. <EFOFEX>
   id:fxe{cf2679de-7d13-435f-91b9-d24496d7c18d}
   FXGP:DP-KUMVDM5
   FXData:

   </EFOFEX>
2. <EFOFEX>
   id:fxe{143e4802-70e4-4059-a82b-476bdbe72ff9}
   FXGP:DP-KUMVDM5
   FXData:

   </EFOFEX>
3. 45°, 35.3° and 99.7°
4. 97.2°
5. <EFOFEX>
   id:fxe{81b3af24-ebcb-4757-b23d-e554a4514fb6}
   FXGP:DP-LGA439R
   FXData:

   </EFOFEX>

Right Angle Trigonometry – Challenge Questions - Solutions

1. The two triangles below have the same area. How large is angle CAD?

<EFOFEX>
id:fxd{f7f812bd-0b2a-489c-a9a7-26f52a2bc1bb}
FXGP:DP-KUMVDM5
FXData:
</EFOFEX>`

The best way to start this question is make one of the sides a standard length. In this case the best way is to make AC = 1. The other sides then determined relative to this.

<EFOFEX>
id:fxe{f09fcc82-baf1-4fc3-b06f-58bf4d561156}
FXGP:DP-KUMVDM5
FXData:

</EFOFEX>

<EFOFEX>
id:fxe{57325bef-4df6-4042-be19-9a3b537c2f7f}
FXGP:DP-KUMVDM5
FXData:

</EFOFEX>

2. This time, the two triangles have the same PERIMETER. Again, how large is angle CAD?

In this question we use the same technique of setting the length of one side. In this case we need an extra side, z.

Using Pythagoras.

<EFOFEX>
id:fxe{722d29a8-2ef5-4501-a17c-936c97a1ef3f}

FXData:

</EFOFEX>

Because the perimeters of the triangles are the same

<EFOFEX>
id:fxe{bdf40463-077f-487a-91d2-9252084d60a2}
FXGP:DP-KUMVDM5
FXData:

</EFOFEX>

<EFOFEX>
id:fxe{170402a2-1da0-44f6-87f9-9f24a010047a}
FXGP:DP-KUMVDM5
FXData:

</EFOFEX>

Therefore angle CAD is approximately id:fxe{9140838c-2fbb-4f9d-a27a-3c5e4e067d85}


FXData:

 degrees.

<EFOFEX>
id:fxd{381c6b0e-aaff-4649-82bc-39aa33d3da59}
FXGP:DP-KUMVDM5
FXData:
</EFOFEX>

3. This triangle has been divided so that the area of the blue (right) side is id:fxe{a2e4aebb-3d83-42bb-8caa-e4d73324015d}


FXData:

 times the area of the red (left) side. What are the angles of triangle ABC?

Assume sides to be one as shown.

id:fxe{f8a7b6cc-5fb6-47f3-b6fc-be23a9670f80}


FXData:



id:fxe{c32aac73-e6c8-4556-ace9-6258160a9625}


FXData:

 Angles are 45°, 35.3° and 99.7°

4. A cone is produced by removing a quarter of a circle and joining the two edges. When you look at the code from the side, what angle is formed by the two sloping sides?

<EFOFEX>
id:fxd{9db38779-99f2-4c54-b0ab-135beb992a76}
FXGP:DP-KUMVDM5
FXData:
</EFOFEX>

Assume that the radius of the original circle = 1

<EFOFEX>
id:fxd{1915cc9c-c625-403f-aac0-c1e65de0ac8d}
FXGP:DP-KUMVDM5
FXData:
</EFOFEX> id:fxe{463996c1-fc2d-4104-b901-093ea9293257}


FXData:



On this cross section of the cone you can see the radius of the base and the radius of the original circle which becomes the slope height of the cone.

<EFOFEX>
id:fxd{d0eb1453-cc38-45f7-a4fd-802c2651a4ad}
FXGP:DP-LGA439R
FXData:
</EFOFEX> id:fxe{25d63f6d-c3df-42a2-bfc1-a27803bfda28}


FXData:



5. An kitchen supply company is designing a new edge-moulding for benchtops that has this design.

All distances are in millimetres. You can assume that the straight edges are tangential to the rounded corner. Find the size of angle x.

The solution to this question requires you to add a lot of extra lines to the diagram. From the diagram, with a little geometry, you can show that triangle ADE is similar to triangle CBA. You use this to solve the question.

<EFOFEX>
id:fxe{279a09f4-8bd1-43bd-8f6e-792e54ebc49c}
FXGP:DP-LGA439R
FXData:

</EFOFEX>

id:fxe{78f13cfa-1fad-4647-bdba-7d851cf75bb1}


FXData:



<EFOFEX>
id:fxe{2b359e8c-8434-4d13-9b9f-3786bc91b0c6}
FXGP:DP-LGA439R
FXData:

</EFOFEX>