Vertically opposite angles

Mana Maths

Te reo Māori terms

koki tauaro
vertically opposite angles
Open in Te Aka

pūtahi
intersection
Open in Te Aka

tāhū
line
Open in Te Aka

koi
point
Open in Te Aka

Vertically opposite angles — Foundation

1. Two straight lines cross. One angle is $68°$. The vertically opposite angle is x. Find x.

2. Two straight lines cross. One angle is $95°$. The vertically opposite angle is y. Find y.

3. Two straight lines cross. One angle is $53°$. The vertically opposite angle is a. Find a.

4. Two straight lines cross. One angle is $41°$. The vertically opposite angle is b. Find b.

5. Two straight lines cross. One angle is $106°$. The vertically opposite angle is c. Find c.

6. Two straight lines cross. One angle is $118°$. The vertically opposite angle is d. Find d.

7. Write the rule that links vertically opposite angles.

8. One angle is $33°$. What is the vertically opposite angle?

9. One angle is $146°$. What is the vertically opposite angle?

10. Two straight lines cross. One angle is 142°. The vertically opposite angle is m. Find m.

11. Two straight lines cross. One angle is 84°. The vertically opposite angle is n. Find n.

12. A student says vertically opposite angles add to 180°. Correct the statement.

13. Two straight lines cross. One angle is 125°. The vertically opposite angle is p. Find p.

14. Explain in one short sentence how you spot vertically opposite angles in a crossing-lines diagram.

Vertically opposite angles — Proficient

1. Two vertically opposite angles are $(x + 14)°$ and $(3x - 22)°$. Find x.

2. Two vertically opposite angles are $(2y + 5)°$ and $97°$. Find y.

3. Two vertically opposite angles are $(2a - 10)°$ and $(a + 18)°$. Find a.

4. Two vertically opposite angles are $(4b - 9)°$ and $(2b + 31)°$. Find b.

5. Two vertically opposite angles are $(3c + 12)°$ and $150°$. Find c.

6. Two vertically opposite angles are $(5d - 3)°$ and $(3d + 39)°$. Find d.

7. One angle is $x°$. The vertically opposite angle is $(x + 18)°$. What does this tell you about x?

8. Two vertically opposite angles are $(2m + 11)°$ and $(m + 58)°$. Find m.

9. Two straight lines cross. One angle is $58°$. Find the other three angles.

10. Two straight lines cross. One angle is 133°. Find the other three angles.

11. Explain why knowing one angle in an intersecting-lines diagram lets you find all four angles.

12. A student says angles of 72° and 108° are vertically opposite because they are across from each other in a sketch. What check should they make first?

Vertically opposite angles — Excellence

1. Find x and all four angles if the two vertically opposite angles are $(3x - 6)^\circ$ and the two adjacent angles are $(2x + 16)^\circ$.

2. Find y and all four angles if one pair of vertically opposite angles is $(5y - 43)^\circ$ and the other pair is 137°.

3. Find a and all four angles if one pair of vertically opposite angles is $(2a + 9)^\circ$ and the other pair is $(4a - 3)^\circ$.

4. Find b. Then state whether $(3b + 12)^\circ$ is acute or obtuse if its adjacent angle is $(6b - 18)^\circ$.

5. Two vertically opposite angles are $(7m - 8)^\circ$ and $(4m + 22)^\circ$. Find m.

6. One angle is $(2n + 5)^\circ$ and an adjacent angle is $(5n - 20)^\circ$. Find n.

7. Find p if one angle is $(p + 31)^\circ$ and an adjacent angle is $(2p - 7)^\circ$.

8. Find q if one angle is $(4q + 8)^\circ$ and an adjacent angle is $(q + 72)^\circ$.

9. The obtuse angle in an intersecting-lines diagram is three times the acute angle. Find both angle sizes.

10. The acute angle is 18° less than the obtuse angle. Find both angle sizes.

11. A student measured one angle as about 88° and wrote the opposite angle as 92°. Explain what is wrong.

12. Create an expression for the angle opposite $(x + 27)^\circ$. Then create an expression for an adjacent angle.

13. Find k if the acute angle is $(k + 14)^\circ$ and the obtuse angle is $(2k + 58)^\circ$.

14. Explain why vertically opposite angles stay equal even if the intersecting lines are tilted or rotated.

15. If one angle in intersecting lines is doubled, does the vertically opposite angle also double? Explain.

16. Write one original vertically-opposite-angles problem of your own, then solve it.