Identify Adjacent and Vertical Angles

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7.2 Identify Adjacent and Vertical Angles

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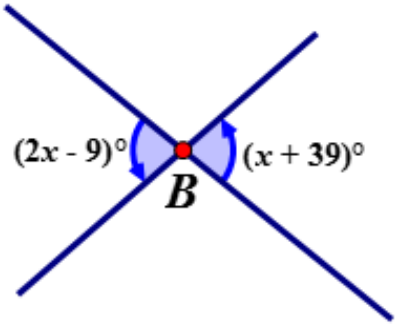
[Figure 1]

Susan has taken a keen interest in Geometry and wants to expand her knowledge of angles. While looking through a magazine she saw the following picture:



[Figure 2]

Susan knew the angles had a relationship but she couldn't remember what they were called or how she could use the information to figure out the size of the angles.

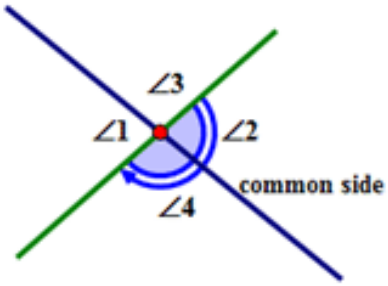
How can Susan use the given measures of the angles to find the measure of each angle in degrees?

In this concept, you will learn to identify adjacent and vertical angles.

Adjacent and Vertical Angles

When two straight lines intersect each other, four angles are created such that the point of intersection is the vertex for each angle. If two of the angles have a common vertex and

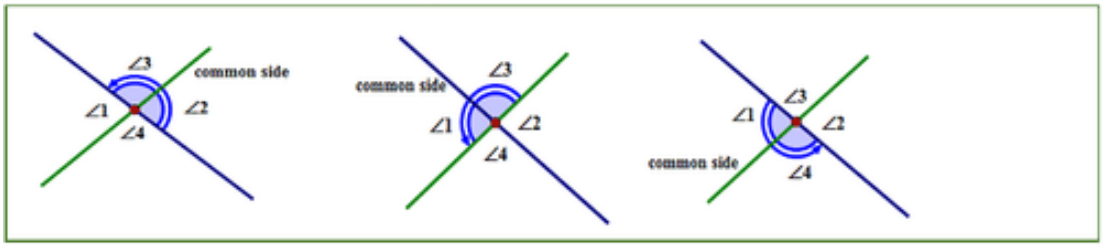
share a common side they are called **adjacent angles**. The adjacent angles formed by two intersecting lines are supplementary which means the sum of their measures is $180°$.



[Figure 3]

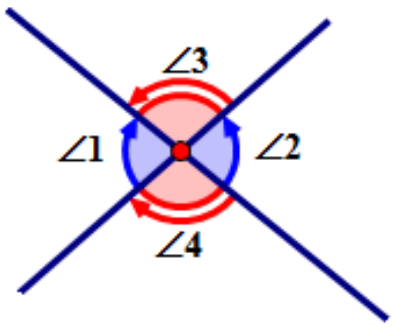
$\angle 2$ and $\angle 4$ are adjacent angles. The angles are next to each other, have common vertex and share the common side. $m\angle 2 + m\angle 4 = 180°$

These are not the only adjacent angles formed by the intersection of the lines. The remaining pairs of adjacent angles are shown below:



[Figure 4]

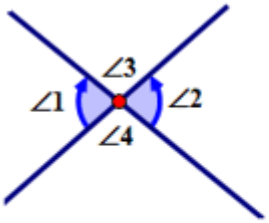
When two lines intersect, **vertical angles**, which are non-adjacent angles are also formed. There are two pairs of vertical angles. These angles also have a common vertex but never share a common side. The **vertical angles** are opposite each other and are equal in measure.



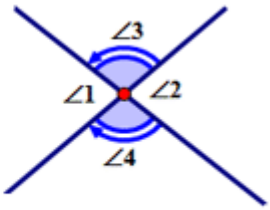
[Figure 5]

There are two pair of vertical angles:

$\angle 1$ and $\angle 2$; $\angle 3$ and $\angle 4$. The $m\angle 1 = m\angle 2$ and $m\angle 3 = m\angle 4$.



$m\angle 1 = m\angle 2$

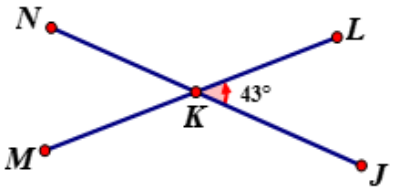


$m\angle 3 = m\angle 4$

[Figure 6]

Let's apply all this information about angles to a problem.

Using the following diagram, calculate the measures of the remaining three angles.



[Figure 7]

First, state the relationship between $\angle JKL$ and one other angle.

$\angle JKL$ and $\angle LKN$ are adjacent angles.

Next, use this relationship to calculate the measure of $\angle LKN$.

$$m\angle JKL + m\angle LKN = 180^\circ$$

Next, substitute 43°, for the measure of $\angle JKL$ in the equation.

$$\begin{aligned} m\angle JKL + m\angle LKN &= 180^\circ \\ 43^\circ + m\angle LKN &= 180^\circ \end{aligned}$$

Next, subtract 43° from both sides of the equation to solve for $m\angle MKN$.

$$\begin{aligned} 43^\circ + m\angle LKN &= 180^\circ \\ 43^\circ - 43^\circ + m\angle LKN &= 180^\circ - 43^\circ \\ m\angle LKN &= 137^\circ \end{aligned}$$

First, state another relationship between $\angle JKL$ and another angle.

$\angle JKL$ and $\angle MKN$ are vertical angles.

Next, use this relationship to calculate the measure of $\angle MKN$.

$$m\angle JKL = m\angle MKN$$

Next, substitute $43°$, for the measure of $\angle JKL$ in the equation.

$$\begin{aligned} m\angle JKL &= m\angle MKN \\ 43° &= m\angle MKN \end{aligned}$$

First, state the relationship between the remaining angle and one other angle.

$\angle LKN$ and $\angle JKM$ are vertical angles.

Next, use this relationship to calculate the measure of $\angle JKM$.

$$m\angle LKN = m\angle JKM$$

Next, substitute $137°$, for the measure of $\angle LKN$ in the equation.

$$\begin{aligned} m\angle LKN &= m\angle JKM \\ 137° &= m\angle JKM \end{aligned}$$

Examples

Example 1

Earlier, you were given a problem about Susan and her interest in Geometry.

She needs to figure out the measure of two equal angles.

The two given angles are opposite each other. These angles are vertical angles.

Susan can use the fact that vertical angles are equal in measure to calculate the measure of these angles.

First, write the relation between the two vertical angles such that $\angle 1 = (2x - 9)°$ and $\angle 2 = (x + 39)°$.

$$m\angle 1 = m\angle 2$$

Next, substitute the values for each angle into the equation.

$$(2x - 9)^\circ = (x + 39)^\circ$$

Next, clear the parenthesis by multiplying both sides of the equation by one.

$$2x - 9^\circ = x + 39^\circ$$

Next, add 9 to both sides of the equation to group the constants on one side of the equation.

$$\begin{aligned} 2x - 9^\circ &= x + 39^\circ \\ 2x - 9^\circ + 9^\circ &= x + 39^\circ + 9^\circ \\ 2x &= x + 48^\circ \end{aligned}$$

Next, subtract 'x' from both sides of the equation to group the variables on one side of the equation.

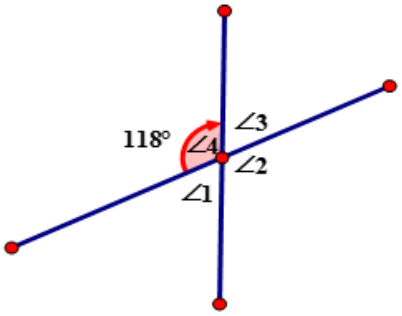
$$\begin{aligned} 2x &= x + 48^\circ \\ 2x - x &= x - x + 48^\circ \\ x &= 48^\circ \end{aligned}$$

Use the value of the variable to calculate the measure of $\angle 1$ and $\angle 2$.

$$\begin{aligned} \angle 1 &= (2x - 9)^\circ \text{ and } \angle 2 = (x + 39)^\circ \\ \angle 1 &= (2(48) - 9)^\circ \text{ and } \angle 2 = (48 + 39)^\circ \\ \angle 1 &= (96 - 9)^\circ \text{ and } \angle 2 = (48 + 39)^\circ \\ \angle 1 &= 87^\circ \text{ and } \angle 2 = 87^\circ \end{aligned}$$

The measures of the two vertical angles are equal.

Using the following diagram, calculate the measures of the remaining three angles.



[Figure 8]

First, state the relationship between $\angle 4$ and one other angle.

$\angle 4$ and $\angle 2$ are vertical angles.

Next, use this relationship to calculate the measure of $\angle 2$.

$$m\angle 4 = m\angle 2$$

Next, substitute $118°$, for the measure of $\angle 4$ in the equation.

$$\begin{aligned} m\angle 4 &= m\angle 2 \\ 118° &= m\angle 2 \end{aligned}$$

First, state another relationship between $\angle 4$ and another angle.

$\angle 4$ and $\angle 1$ are adjacent angles.

Next, use this relationship to calculate the measure of $\angle 1$.

$$m\angle 4 + m\angle 1 = 180°$$

Next, substitute $118°$, for the measure of $\angle 4$ in the equation.

$$\begin{aligned} m\angle 4 + m\angle 1 &= 180° \\ 118° + m\angle 1 &= 180° \end{aligned}$$

Next, subtract $118°$ from both sides of the equation to solve for $m\angle 1$.

$$\begin{aligned} 118° + m\angle 1 &= 180° \\ 118° - 118° + m\angle 1 &= 180° - 118° \\ m\angle 1 &= 62° \end{aligned}$$

First, state the relationship between the remaining angle and one other angle.

$\angle 1$ and $\angle 3$ are vertical angles.

Next, use this relationship to calculate the measure of $\angle 3$.

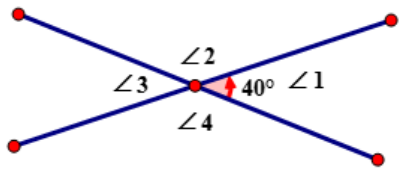
$$m\angle 1 = m\angle 3$$

Next, substitute $62°$, for the measure of $\angle 1$ in the equation.

$$\begin{aligned} m\angle 1 &= m\angle 3 \\ 62° &= m\angle 3 \end{aligned}$$

Example 2

Using the following diagram, calculate the measures of the remaining three angles.



[Figure 9]

First, state the relationship between $\angle 1$ and one other angle.

$\angle 1$ and $\angle 3$ are vertical angles.

Next, use this relationship to calculate the measure of $\angle 3$.

$$m\angle 1 = m\angle 3$$

Next, substitute $40°$, for the measure of $\angle 1$ in the equation.

$$\begin{aligned} m\angle 1 &= m\angle 3 \\ 40^\circ &= m\angle 3 \end{aligned}$$

First, state another relationship between $\angle 1$ and another angle.

$\angle 1$ and $\angle 4$ are adjacent angles.

Next, use this relationship to calculate the measure of $\angle 4$.

$$m\angle 1 + m\angle 4 = 180^\circ$$

Next, substitute 40°, for the measure of $\angle 1$ in the equation.

$$\begin{aligned} m\angle 1 + m\angle 4 &= 180^\circ \\ 40^\circ + m\angle 4 &= 180^\circ \end{aligned}$$

Next, subtract 40° from both sides of the equation to solve for $m\angle 4$.

$$\begin{aligned} 40^\circ + m\angle 4 &= 180^\circ \\ 40^\circ - 40^\circ + m\angle 4 &= 180^\circ - 40^\circ \\ m\angle 4 &= 140^\circ \end{aligned}$$

First, state the relationship between the remaining angle and one other angle.

$\angle 4$ and $\angle 2$ are vertical angles.

Next, use this relationship to calculate the measure of $\angle 3$.

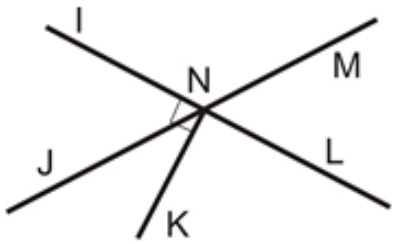
$$m\angle 4 = m\angle 2$$

Next, substitute 140°, for the measure of $\angle 4$ in the equation.

$$\begin{aligned} m\angle 4 &= m\angle 2 \\ 140^\circ &= m\angle 2 \end{aligned}$$

Review

Identify whether each angle pair can be classified as adjacent angles or vertical angles or neither.



[Figure 10]

1. $\angle INK$ and $\angle MNL$

2. $\angle INJ$ and $\angle JNK$

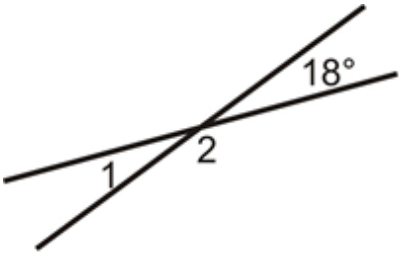
3. $\angle MNL$ and $\angle LNK$

4. $\angle JNL$ and $\angle INM$

5. $\angle INM$ and $\angle KNL$

6. If $m\angle INJ = 63°$ then $m\angle MNL =$ _____°.

Use this diagram to answer the following questions.



[Figure 11]

7. True or False. $\angle 1$ and $\angle 2$ are adjacent angles.

8. What is the measure of $\angle 1$?

9. What is the measure of $\angle 2$?

10. What is the relationship between $\angle 2$ and the angle opposite it?

11. True or False. Adjacent angles 1 and 2 form a straight line with a value of $180°$

Answer true or false for each question.

12. Supplementary angles are also vertical angles.

13. Vertical angles have the same measure.

14. Adjacent angles always have a sum of $180°$.

15. Adjacent angles are also vertical angles.

16. Vertical angles are formed when lines intersect.

Review (Answers)

To see the review answers, return to the Table of Contents and select 'Other Versions' or 'Resources'.

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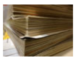
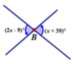
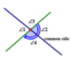
	**Credit:** ad.mak **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe
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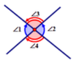
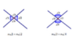
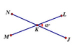
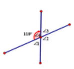
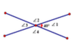
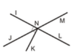
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe
	**Credit:** ad.mak;Marja van Bochove **Source:** https://www.flickr.com/photos/roll/4866335557/in/photolist-8q2f2c-5Amwum-8it9pw-6a3PFr-qwDL4S-5UHHGb-a94uDf-qXfgh4-9nfUj6-294D5m-f6kHAN-8gmh3L-8ghZ6X-8gmdS3-b3SXpF-8yoyTq-8gmd2m-8ghW86-8gmgzN-b4xArg-6nrVw6-8ykw68-8ghZt8-4uhboy-8gmek5-8gmhTs-8gi3cr-8gmhqG-8gmdTN-8gmibS-8gmirq-8ghXUH-8gmh67-8gmdCN-8ghWke-8gi1p8-8gmg8m-8gmcGJ-8gmgvm-8ghYmR-8gi35k-8gmhBC-8gi3jK-8gmfaN-8gi3ap-8gi1K6-8gmh1U-8ghXDa-8ghVNV-8gmdY7 ; https://www.flickr.com/photos/on1stsite/4729849272/in/photolist-aav5nQ-qHeXGm-8cXHpo-4VAE7s-uD7mnD-8MWwpf-ow3LNj-o9U3yp-mY6To9-nP3NHB-nStqCD-naNWoA-5WxrpT-3K959Z-mv9A3p-hqnHrr-c6SGx5-949R4c-ouxVmx-6ohCwy-nwQzjA-oT891c-nVmoYR-pXZ2jU-oHdqu2-oA59fb-6AjXKk-ds95vL-aEZ8ZS-e29nsh-dW7ZWC-m5QxLP-sGwx1k-6tocay-dUCRtC-5F4uFi-8xm4ar-4SdTfi-rTfkoV-8sfHFp-ifzd25-bdc7Vx-oj96ZJ-bdc5yM-pHigra-pJcHBV-29Exv6-6QzAAV-mkppoD-oAayKe

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