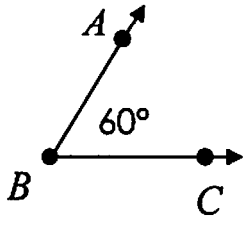
Name:	Date:
Topic:	Class:

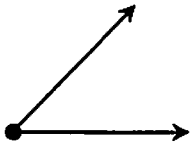
Main Ideas/Questions	Notes

Angles

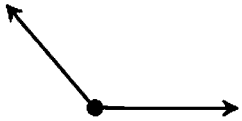


- An angle is formed by two rays with a common endpoint.
- This common endpoint is called the vertex
- The rays are called the sides.
- Name an angle using 3 letters. The middle letter must always represent the vertex!
- Use a single letter if there is only one angle located at the vertex.
- When referring to the measure of an angle, use a lowercase *m*.
  Example: $m\angle ABC = 60°$

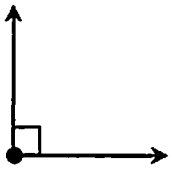
types of Angles



acute (less than 90°)



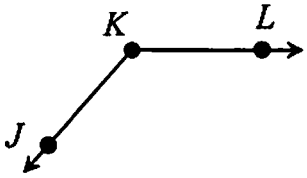
obtuse (greater than 90°)



right (equal to 90°)

straight (equal to 180°)

Example 1



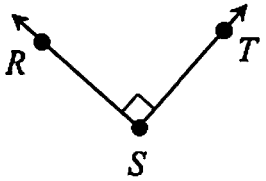
a) Name the vertex of the angle. K

b) Name the sides of the angle. $\overrightarrow{KJ}$ and $\overrightarrow{KL}$

c) Give three ways to name the angle.
∠K, ∠JKL, ∠LKJ

d) Classify the angle. obtuse

Example 2



a) Name the vertex of the angle. S

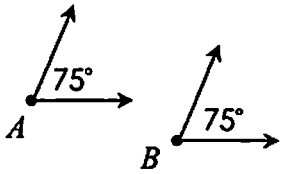
b) Name the sides of the angle. $\overrightarrow{SR}$, $\overrightarrow{ST}$

c) Give three ways to name the angle.
∠S, ∠RST, ∠TSR

d) Classify the angle. right

Congruent Angles

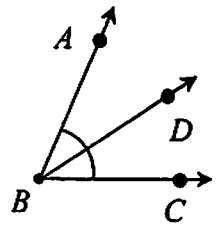
If $m\angle A = m\angle B$, then the angles are congruent. This is written as $\angle A \cong \angle B$.



Angle Bisector

A ray that divides an angle into 2 congruent angles.

In the diagram to the right, $\overrightarrow{BD}$ is an angle bisector, therefore, $\angle ABD \cong \angle DBC$.

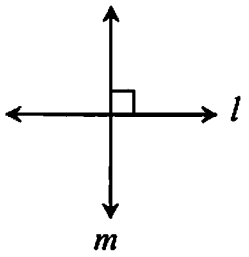


Perpendicular Lines

Two lines that intersect at a right angle.

The symbol for perpendicular is $\perp$.

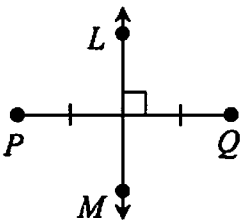
In the diagram to the right, $l \perp m$.



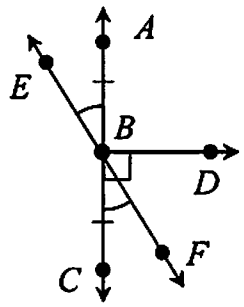
Perpendicular Bisector

A line, segment, or ray perpendicular to a segment at its midpoint.

In the diagram to the right, $\overline{LM}$ is the perpendicular bisector to $\overline{PQ}$.



Example 3



a) Write another name for $\angle CBF$. $\angle FBC$

b) Name the sides of $\angle EBD$. $\overrightarrow{EB}$ and $\overrightarrow{BD}$

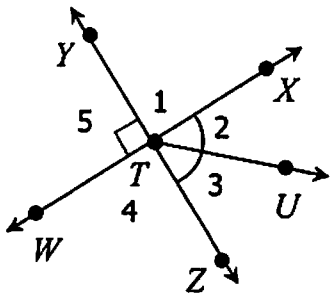
c) Classify $\angle ABC$. Straight

d) Give an example of an obtuse angle. $\angle EBC$

e) Name two congruent angles. $\angle EBA$ and $\angle FBC$

f) Name a perpendicular bisector. $\overline{BD}$

Example 4



a) Name the vertex of $\angle 2$. T

b) Name the sides of $\angle 4$. $\overrightarrow{TW}$ and $\overrightarrow{TZ}$

c) Write another name for $\angle 3$. $\angle ZTU$

d) Write another name for $\angle 1$. $\angle YTX$

e) Classify $\angle YTW$. right

f) Classify $\angle YTU$. obtuse

g) Classify $\angle XTU$. acute

h) Classify $\angle WTX$. Straight

i) Name two perpendicular lines. $\overleftrightarrow{WX}$ and $\overleftrightarrow{YZ}$

j) Name an angle bisector. $\overrightarrow{TU}$

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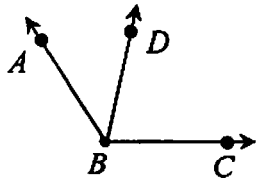
Main Ideas/Questions	Notes/Examples

ANGLE ADDITION Postulate

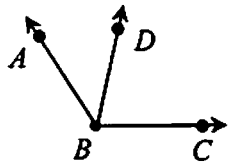
If D is in the interior of $\angle ABC$, then

$\angle ABD + \angle DBC = \angle ABC$



Examples

Use the diagram below to answer questions 1 and 2.



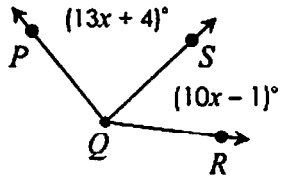
1. If $m\angle ABD = 48°$ and $m\angle DBC = 78°$, find $m\angle ABC$.

$48 + 78 = \boxed{126°}$

2. If $m\angle DBC = 74°$ and $m\angle ABC = 119°$, find $m\angle ABD$.

$119 - 74 = \boxed{45°}$

3. If $m\angle PQR = 141°$, find each measure.



$13x+4 + 10x-1 = 141$

$23x + 3 = 141$

$23x = 138$

$x = 6$

$m\angle PQS: 13(6)+4 = 82$

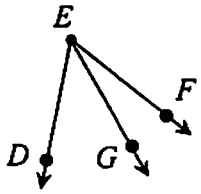
$m\angle SQR: 10(6)-1 = 59$

$x =$ 6

$m\angle PQS =$ 82°

$m\angle SQR =$ 59°

4. If $m\angle DEF = (7x + 4)°$, $m\angle DEG = (5x + 1)°$, and $m\angle GEF = 23°$, find each measure.



$7x+4 = 5x+1+23$

$7x+4 = 5x+24$

$2x+4 = 24$

$2x = 20$

$x = 10$

$m\angle DEG: 5(10)+1 = 51$

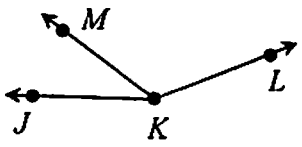
$m\angle DEF: 7(10)+4$

$x =$ 10

$m\angle DEG =$ 51°

$m\angle DEF =$ 74°

5. If $m\angle JKM = 43°$, $m\angle MKL = (8x - 20)°$, and $m\angle JKL = (10x - 11)°$, find each measure.



$43 + 8x - 20 = 10x - 11$

$8x + 23 = 10x - 11$

$23 = 2x - 11$

$34 = 2x$

$x = 17$

$m\angle MKL: 8(17)-20 = 116$

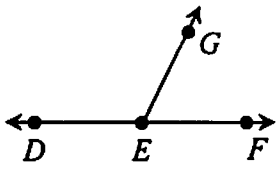
$m\angle JKL: 10(17)-11 = 159$

$x =$ 17

$m\angle MKL =$ 116°

$m\angle JKL =$ 159°

6. If $\angle DEF$ is a straight angle, $m\angle DEG = (23x - 3)°$, and $m\angle GEF = (12x + 8)°$, find each measure.

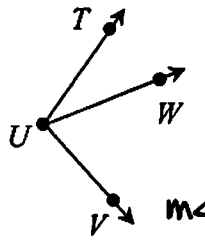


$23x - 3 + 12x + 8 = 180$
$35x + 5 = 180$
$35x = 175$
$x = 5$

$x =$ 5
$m\angle DEG =$ 112°
$m\angle GEF =$ 68°
$m\angle DEF =$ 180°

m∠DEG: 23(5) − 3 = 112
m∠GEF: 12(5) + 8 = 68

7. If $m\angle TUW = (5x + 3)°$, $m\angle WUV = (10x - 5)°$, and $m\angle TUV = (17x - 16)°$, find each measure.

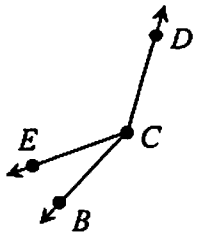


$5x + 3 + 10x - 5 = 17x - 16$
$15x - 2 = 17x - 16$
$-2 = 2x - 16$
$14 = 2x$
$x = 7$

m∠TUW: 5(7) + 3 = 38
m∠WUV: 10(7) − 5 = 65

$x =$ 7
$m\angle TUW =$ 38°
$m\angle WUV =$ 65°
$m\angle TUV =$ 103°

8. If $m\angle ECD$ is six less than five times $m\angle BCE$, and $m\angle BCD = 162°$, find each measure.



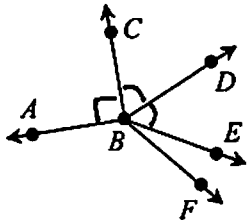
m∠BCE = x
m∠ECD = 5x − 6

$x + 5x - 6 = 162$
$6x - 6 = 162$
$6x = 168$
$x = 28$

m∠ECD: 5(28) − 6 = 134

$m\angle BCE =$ 28°
$m\angle ECD =$ 134°

Use the diagram to the left to answer questions 9 and 10.



9. If $m\angle ABF = (6x + 26)°$, $m\angle EBF = (2x - 9)°$, and $m\angle ABE = (11x - 31)°$, find $m\angle ABF$.

$6x + 26 + 2x - 9 = 11x - 31$
$8x + 17 = 11x - 31$
$8x + 48 = 11x$
$48 = 3x$
$x = 16$

m∠ABF: 6(16) + 26 = 122°

10. If $\overline{BD}$ bisects $\angle CBE$, ~~$\overline{BC} \perp \overline{BA}$~~, $m\angle CBD = (3x + 25)°$, and $m\angle DBE = (7x - 19)°$, find $m\angle ABD$.

$3x + 25 = 7x - 19$
$25 = 4x - 19$
$44 = 4x$
$x = 11$

m∠CBD: 3(11) + 25 = 58

m∠ABD = 90 + 58 = 148°