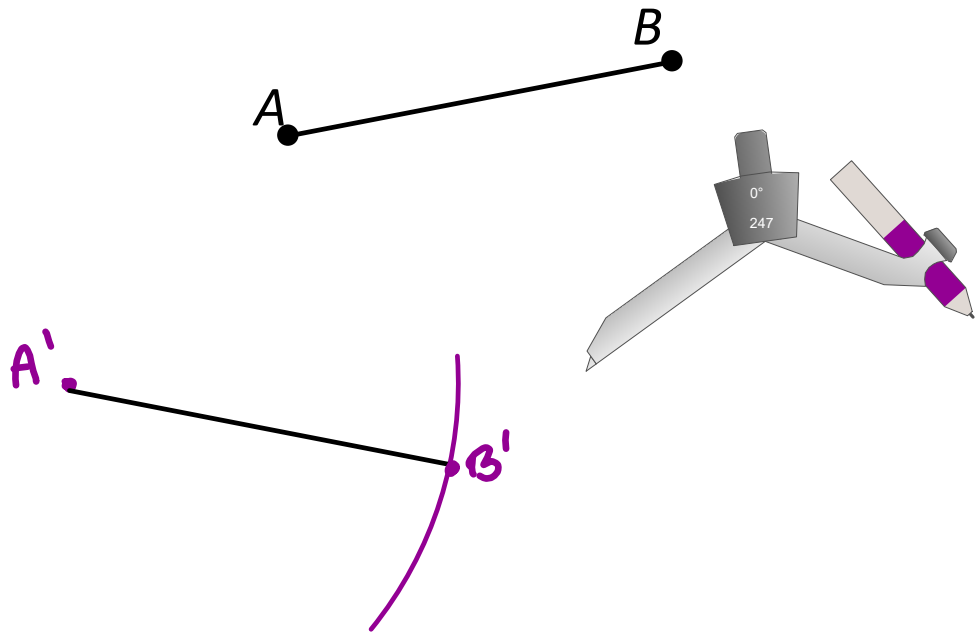
Warm-up

1. Complete front of white paper.

2. On the back, practice drawing circles (some people are page-turners, some people are compass-twirlers.

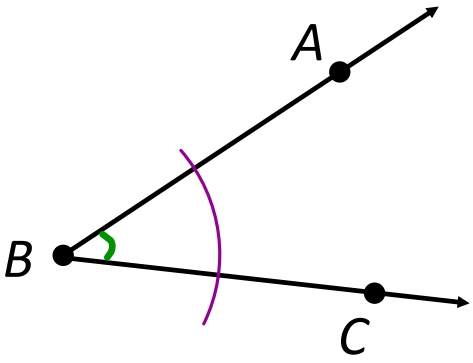
Using constructions to copy a segment

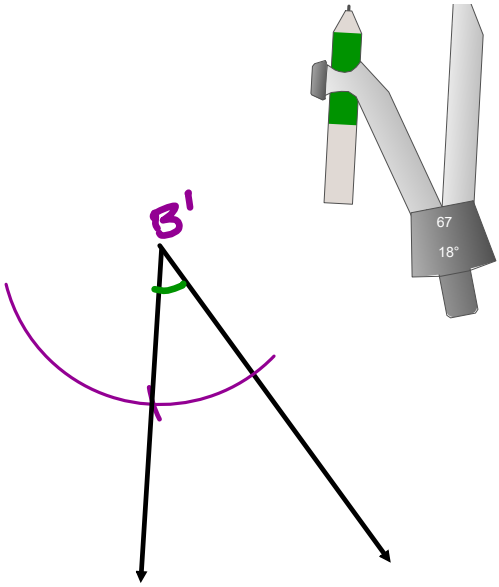
1. Mark an endpoint of the new segment
2. Set the point of the compass onto one of the endpoints of the initial line segment
3. Adjust the compass's width to the other endpoint
4. Without changing the compass's width, place its point on the endpoint of the new segment
5. Draw an arc
6. Mark the other endpoint of the new segment somewhere along the arc
7. Connect the points to create the new segment



Using constructions to copy an angle

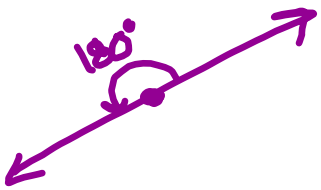
1. Mark the vertex of the new angle
2. Draw a ray extending from that vertex
3. Place the point of the compass on the vertex of the original angle, and open it to any width along one of the rays
4. Draw an arc across both sides of the angle
5. Without changing the compass's width, place the point of the compass on the new vertex and draw the same arc
6. On the original angle, set the width of the compass to equal the distance between the points of intersection of the angle and the arc
7. On the new angle, without changing the compass's width, place the point where the ray and the arc intersect and draw an arc that intersects the existing arc
8. Draw a ray from the vertex through this point of intersection





Types of Angles

Straight: measure = 180°



Right: measure = 90°

Acute: measure between 0° and 90°

Obtuse: measure between 90° and 180°

Find the restrictions on the values of x for an obtuse angle that measures $(7x+33)°$

$90° < \text{obtuse} < 180°$

$90 < 7x+33 < 180$

$-33 \quad -33 \quad -33$

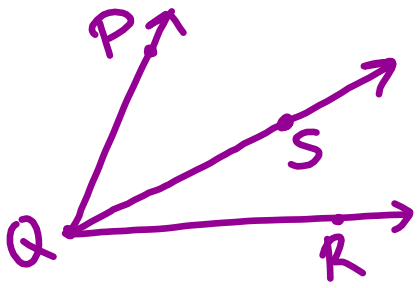
$\frac{57}{7} < \frac{7x}{7} < \frac{147}{7}$

$\frac{57}{7} < x < 21$

Interval notation: $\left(\frac{57}{7}, 21\right)$

Angle Addition Postulate

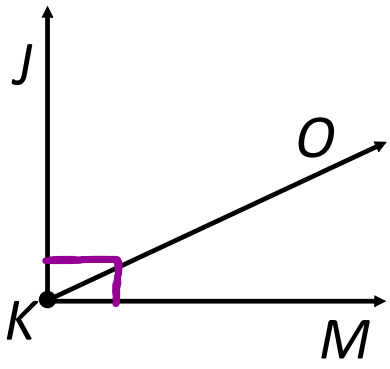
If a point S lies in the interior of $\angle PQR$, then $m\angle PQS + m\angle SQR = m\angle PQR$



Given: $\overrightarrow{KJ} \perp \overrightarrow{KM}$

$\angle JKO$ is four times as large as $\angle MKO$

Find: m$\angle JKO$



$m\angle MKO = x$

$m\angle JKO = 4x$

$m\angle MKO + m\angle JKO = 90$

$4x + x = 90$

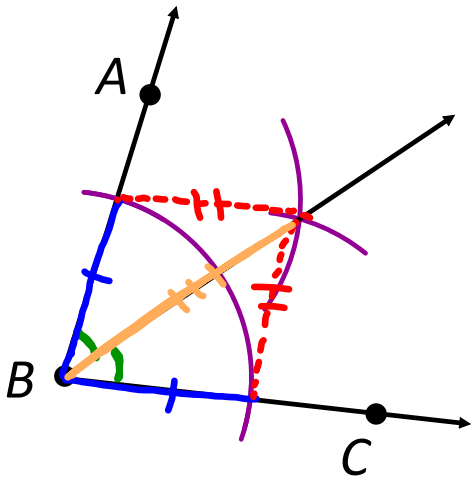
$5x = 90$

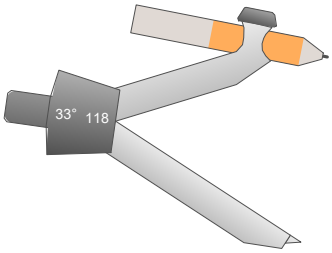
$x = 18$

$m\angle JKO = 4x = 4(18) = 72°$

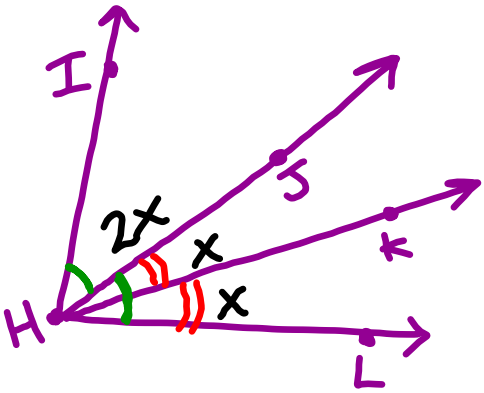
Using constructions to create an angle bisector

1. Place the point of the compass on the vertex of the angle
2. Draw two small arcs using the same width of the compass - one across each leg of the angle
3. Place the point of the compass on one of the two intersection points and draw an arc in the interior of the angle
4. Repeat for the other leg so that the two arcs cross
5. Use a straightedge to draw a segment from the vertex of the angle to the point of intersection of these two interior arcs





$\overrightarrow{HJ}$ bisects $\angle IHL$, $\overrightarrow{HK}$ bisects $\angle JHL$, and $m\angle IHK = 51°$. Find $m\angle IHL$.



$2x + x = 51$

$3x = 51$

$x = 17$

$m\angle IHL = 4x$

$= 4(17)$

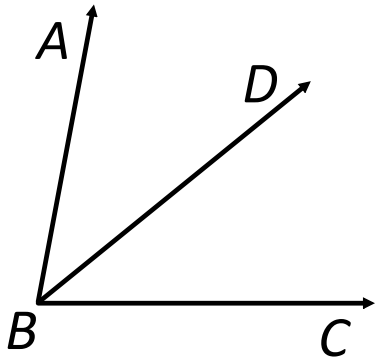
$= 68°$

Given: $m\angle ABC = 78°$

$m\angle ABD = (6x+3)°$

$m\angle DBC = (4x-5)°$

Find: $m\angle ABD$



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

$(6x+3) + (4x-5) = 78$

$10x - 2 = 78$

$10x = 80$

$x = 8$

$m\angle ABD = 6x+3 = 6(8)+3 = 51°$

COMPLEMENTARY ANGLES are two angles whose sum is 90°

SUPPLEMENTARY ANGLES are two angles whose sum is 180°

Two angles are complementary. The measure of one of these angles is three greater than twice the measure of the other. Find the measure of each.

$x + y = 90$

$x = 2y + 3$

$2y + 3 + y = 90$

$3y + 3 = 90$

$3y = 87$

$y = 29$

$x = 90 - 29 = 61°$

$x = 61°$

$y = 29°$

Two times the supplement of an angle is 12 less than six times the complement of the angle. Find the measure of the complement.

$\angle = m$

Comp. of $m = 90 - m$

Supp. of $m = 180 - m$

$2(180 - m) = 6(90 - m) - 12$

$360 - 2m = 540 - 6m - 12$

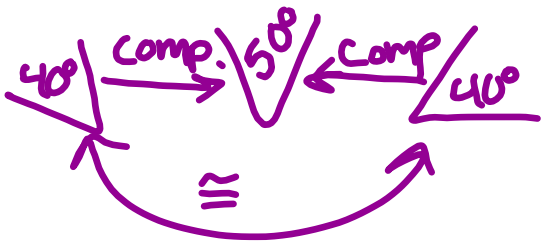
$4m = 168$

$m = 42°$

$90 - 42 = 48°$

Congruent Complements Theorem

If angles are complementary to the same or congruent angles, then they are congruent



If $\angle A$ is complementary to $\angle B$, and $\angle B$ is complementary to $\angle C$, then .. $\angle A \cong \angle C$

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