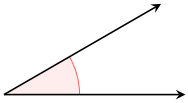
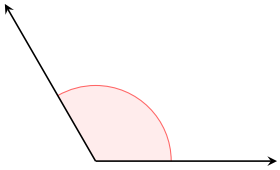
ANGLES

A DEFINITIONS

A.1 COMPARING ANGLES

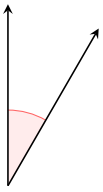
MCQ 1: Which angle has the greater measure?

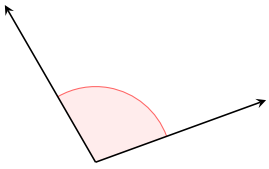
☐ Angle A: 

☒ Angle B: 

Answer: The measure of an angle depends on the opening between its rays. A wider opening means a greater angle measure. Angle B has a wider opening (120°) compared to Angle A (30°). Therefore, Angle B is greater.

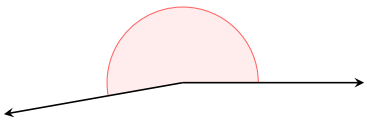
MCQ 2: Which angle has the greater measure?

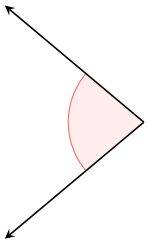
☐ Angle A: 

☒ Angle B: 

Answer: The measure of an angle depends on the opening between its rays. A wider opening means a greater angle measure. Angle B has a wider opening (100°) compared to Angle A (30°). Therefore, Angle B is greater.

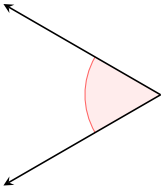
MCQ 3: Which angle has the greater measure?

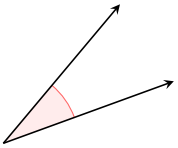
☒ Angle A: 

☐ Angle B: 

Answer: The measure of an angle depends on the opening between its rays. A wider opening means a greater angle measure. Angle A has a wider opening (170°) compared to Angle B (80°). Therefore, Angle A is greater.

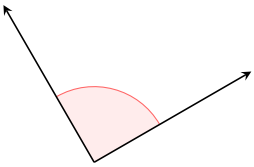
MCQ 4: Which angle has the greater measure?

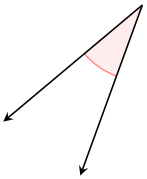
☒ Angle A: 

☐ Angle B: 

Answer: The measure of an angle depends on the opening between its rays. A wider opening means a greater angle measure. Angle A has a wider opening (60°) compared to Angle B (30°). Therefore, Angle A is greater.

MCQ 5: Which angle has the greater measure?

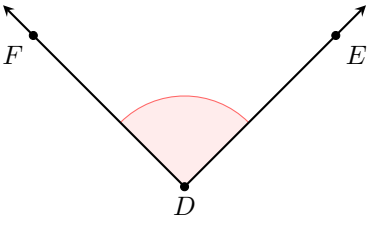
☒ Angle A: 

☐ Angle B: 

Answer: The measure of an angle depends on the opening between its rays. A wider opening means a greater angle measure. Angle A has a wider opening (90°) compared to Angle B (30°). Therefore, Angle A is greater.

A.2 NAMING ANGLES WITH THREE POINTS

MCQ 6: Which option correctly names the marked angle using three-point notation?



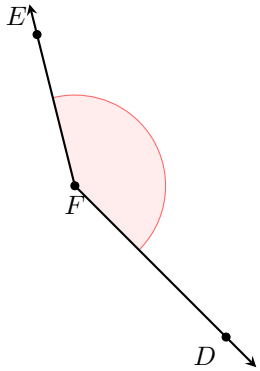
☐ $\angle DEF$

☒ $\angle FDE$

☐ $\angle DFE$

Answer: The marked angle has vertex D, with points E and F on its sides. In three-point notation, the vertex is in the middle, so the correct name is $\angle FDE$.

MCQ 7: Which option correctly names the marked angle using three-point notation?



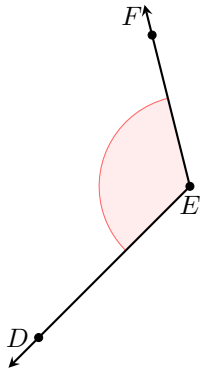
☐ $\angle DEF$

☐ $\angle FDE$

☒ $\angle DFE$

Answer: The marked angle has vertex F, with points D and E on its sides. In three-point notation, the vertex is in the middle, so the correct name is $\angle DFE$.

MCQ 8: Which option correctly names the marked angle using three-point notation?



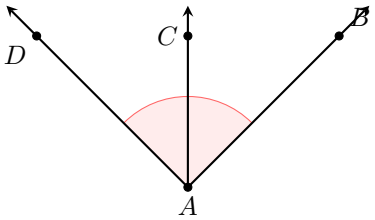
☒ $\angle DEF$

☐ $\angle FDE$

☐ $\angle DFE$

Answer: The marked angle has vertex E, with points D and F on its sides. In three-point notation, the vertex is in the middle, so the correct name is $\angle DEF$.

MCQ 9: Which option correctly names the marked angle using three-point notation?



☐ $\angle ADC$

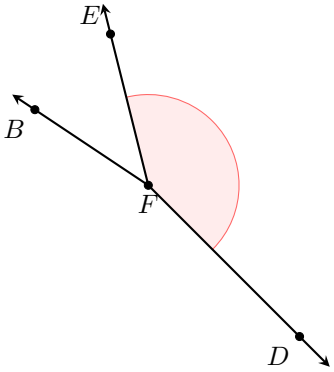
☐ $\angle CAB$

☒ $\angle DAB$

☐ $\angle DAC$

Answer: The marked angle has vertex A, with points D and B on its sides. In three-point notation, the vertex is in the middle, so the correct name is $\angle DAB$.

MCQ 10: Which option correctly names the marked angle using three-point notation?



☐ $\angle BFD$

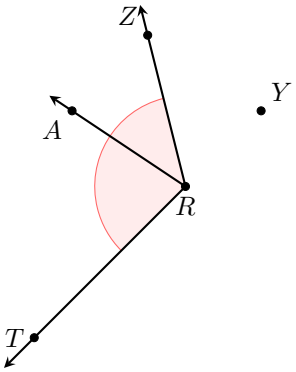
☐ $\angle FDE$

☒ $\angle DFE$

☐ $\angle BFE$

Answer: The marked angle has vertex F, with points D and E on its sides. In three-point notation, the vertex is in the middle, so the correct name is $\angle DFE$.

MCQ 11: Which option correctly names the marked angle using three-point notation?



☐ $\angle TRY$

☒ $\angle ZRT$

☐ $\angle ZRA$

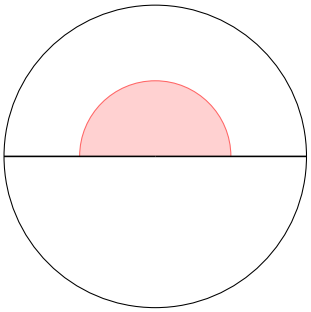
☐ $\angle RZT$

Answer: The marked angle has vertex R, with points T and Z on its sides. In three-point notation, the vertex is in the middle, so the correct name is $\angle ZRT$.

B DEGREES

B.1 DIVIDING THE FULL TURN

Ex 12:

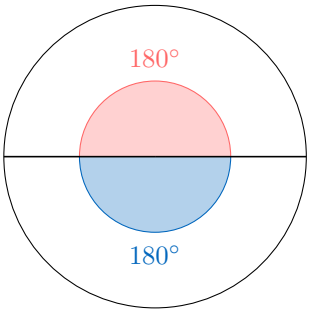


One-half of a full turn measures $\boxed{180}$°.

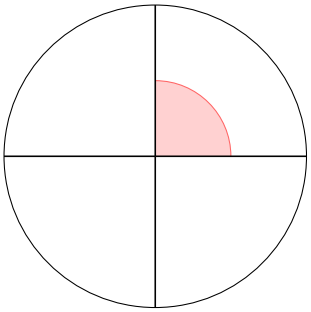
Answer:

$$\begin{aligned}\text{One-half of a full turn} &= \frac{1}{2} \times 360° \\ &= 360° \div 2 \\ &= 180°\end{aligned}$$

$$\begin{array}{r} 180 \\ 2\overline{)360} \\ \underline{2} \\ 16 \\ \underline{16} \\ 00 \end{array}$$



Ex 13:

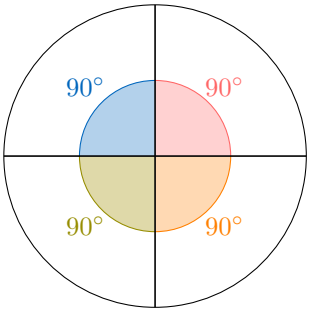


One-quarter of a full turn measures $\boxed{90}$°.

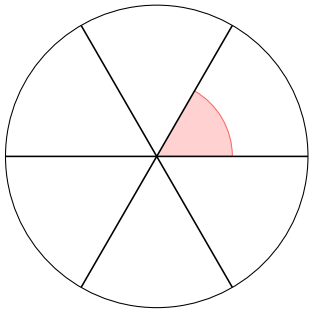
Answer:

$$\begin{aligned}\text{One-quarter of a full turn} &= \frac{1}{4} \times 360° \\ &= 360° \div 4 \\ &= 90°\end{aligned}$$

$$\begin{array}{r} 90 \\ 4\overline{)360} \\ \underline{36} \\ 00 \end{array}$$



Ex 14:

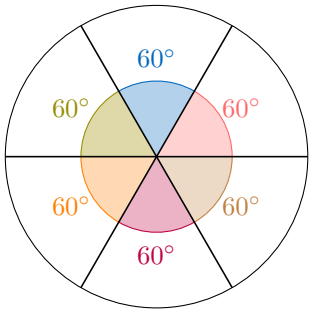


One-sixth of a full turn measures $\boxed{60}$°.

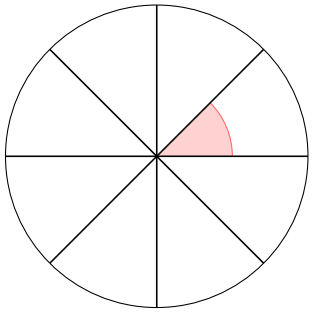
Answer:

$$\begin{aligned}\text{One-sixth of a full turn} &= \frac{1}{6} \times 360° \\ &= 360° \div 6 \\ &= 60°\end{aligned}$$

$$\begin{array}{r} 60 \\ 6\overline{)360} \\ \underline{36} \\ 00 \end{array}$$



Ex 15:

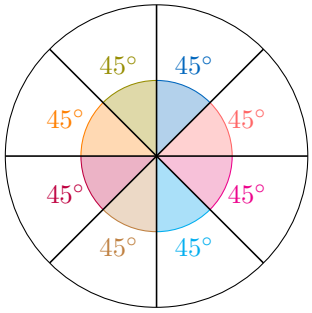


One-eighth of a full turn measures $\boxed{45}$°.

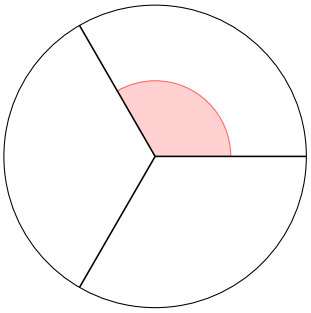
Answer:

$$\begin{aligned}\text{One-eighth of a full turn} &= \frac{1}{8} \times 360° \\ &= 360° \div 8 \\ &= 45°\end{aligned}$$

$$\begin{array}{r} 45 \\ 8\overline{)360} \\ \underline{32} \\ 40 \\ \underline{40} \\ 0 \end{array}$$



Ex 16:

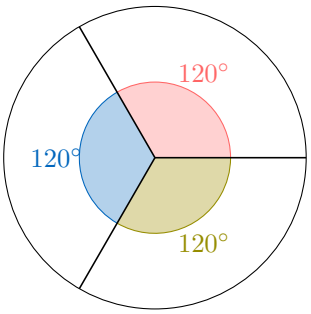


One-third of a full turn measures $\boxed{120}$°.

Answer:

$$\begin{aligned}\text{One-third of a full turn} &= \frac{1}{3} \times 360° \\ &= 360° \div 3 \\ &= 120°\end{aligned}$$

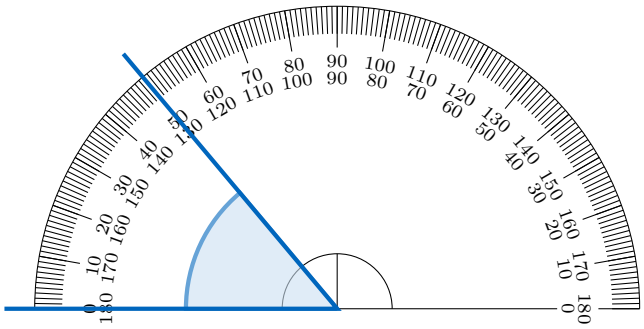
$$\begin{array}{r} 120 \\ 3\overline{)360} \\ \underline{3} \\ 06 \\ \underline{6} \\ 00 \end{array}$$



C MEASURING AND DRAWING ANGLES WITH A PROTRACTOR

C.1 MEASURING ANGLES

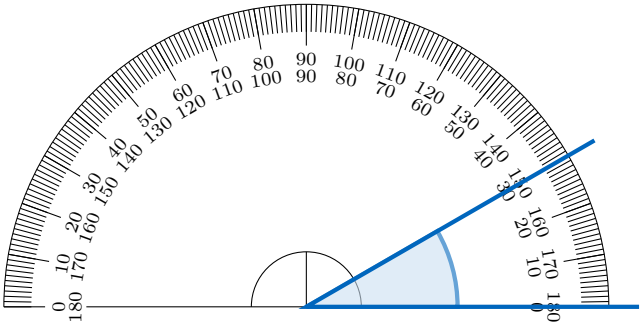
Ex 17:



The angle shown measures $\boxed{50}$°.

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale. Here, one ray aligns with 0°, and the other points to 50°, so the angle measures 50°.

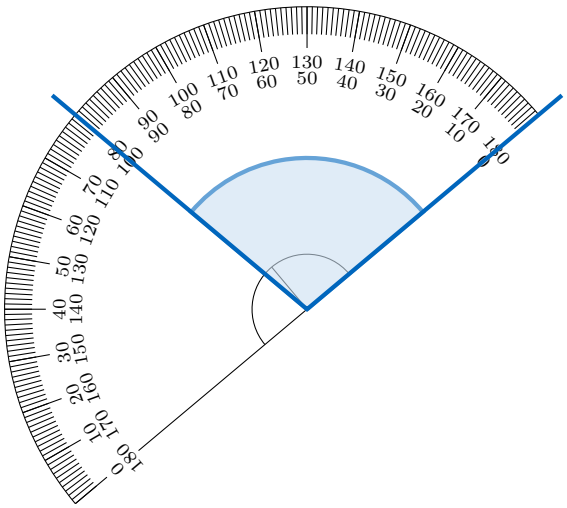
Ex 18:



The angle shown measures $\boxed{30}$°.

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale. Here, one ray aligns with 0°, and the other points to 30°, so the angle measures 30°.

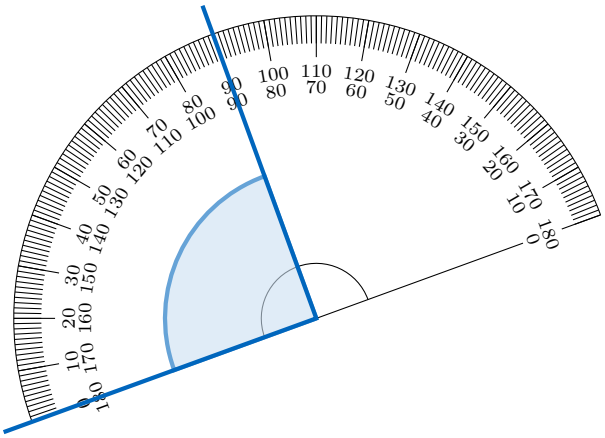
Ex 19:



The angle shown measures $\boxed{100}$°.

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale. Here, one ray aligns with 0°, and the other points to 100°, so the angle measures 100°.

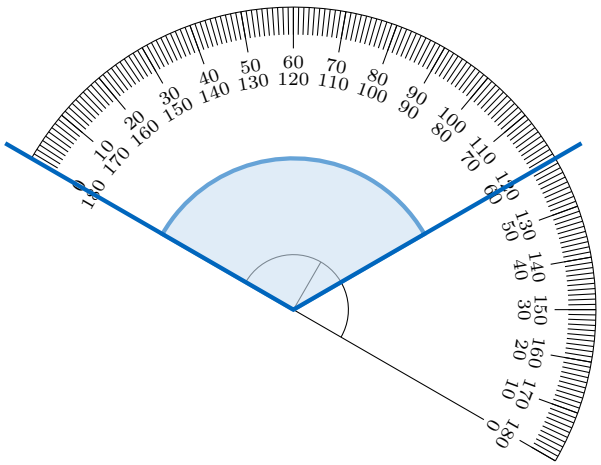
Ex 20:



The angle shown measures $\boxed{90}$°.

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale. Here, one ray aligns with 0°, and the other points to 90°, so the angle measures 90°.

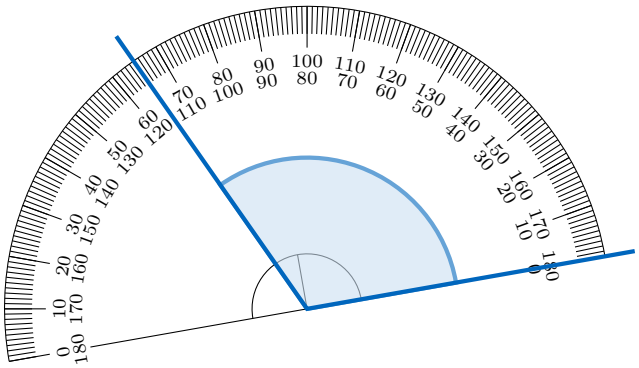
Ex 21:



The angle shown measures $\boxed{120}$°.

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale. Here, one ray aligns with 0°, and the other points to 120°, so the angle measures 120°.

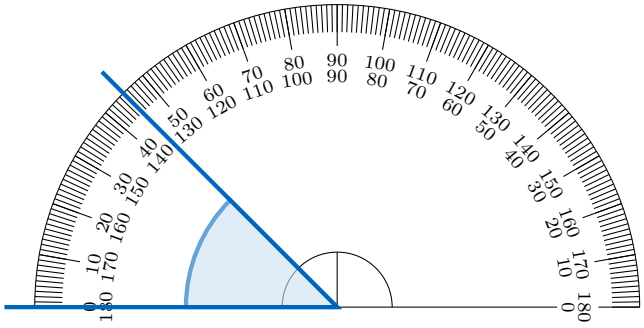
Ex 22:



The angle shown measures $\boxed{115}$°.

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale. Here, one ray aligns with 0°, and the other points to 115°, so the angle measures 115°.

Ex 23:

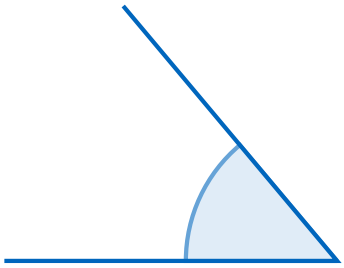


The angle shown measures $\boxed{45}$°.

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale. Here, one ray aligns with 0°, and the other points to 45°, so the angle measures 45°.

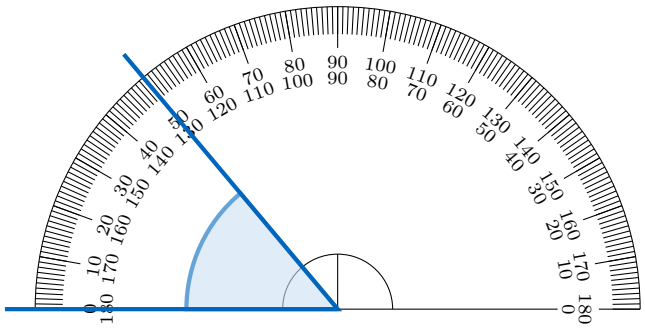
C.2 MEASURING ANGLES

MCQ 24: Using a protractor, find the measure of the angle shown.



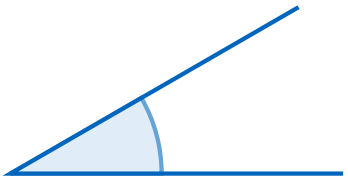
- ☐ 30°
- ☒ 50°
- ☐ 90°
- ☐ 130°

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale.



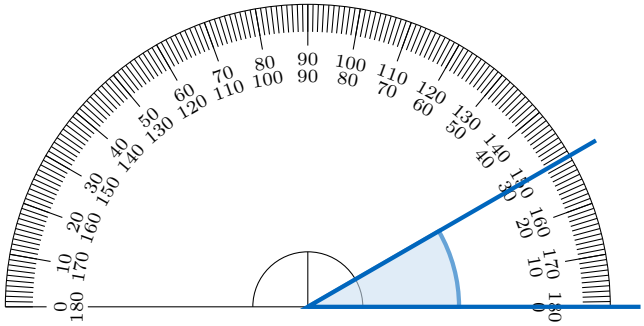
Here, one ray aligns with 0°, and the other points to 50°, so the angle measures 50°.

MCQ 25: Using a protractor, find the measure of the angle shown.



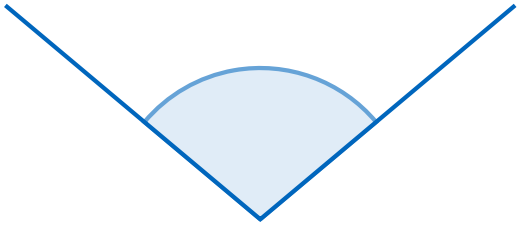
- ☒ 30°
- ☐ 50°
- ☐ 90°
- ☐ 130°

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale.



Here, one ray aligns with 0°, and the other points to 30°, so the angle measures 30°.

MCQ 26: Using a protractor, find the measure of the angle shown.



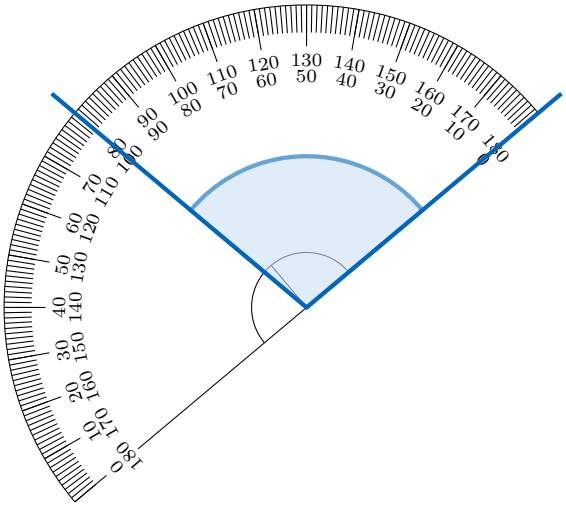
☐ 30°

☐ 50°

☒ 100°

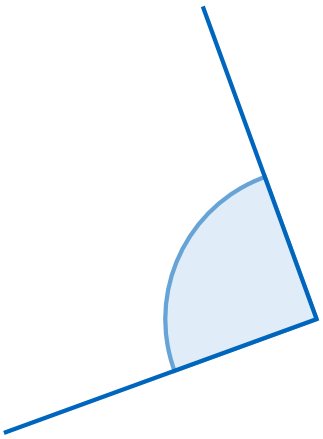
☐ 130°

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale.



Here, one ray aligns with 0°, and the other points to 100°, so the angle measures 100°.

MCQ 27: Using a protractor, find the measure of the angle shown.



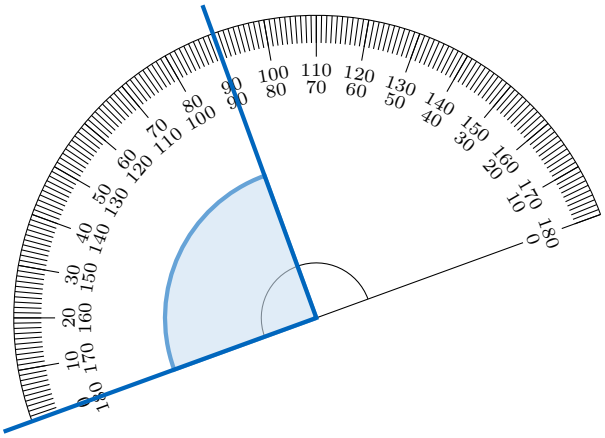
☐ 30°

☐ 50°

☒ 90°

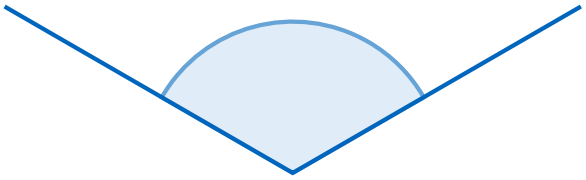
☐ 130°

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale.



Here, one ray aligns with 0°, and the other points to 90°, so the angle measures 90°.

MCQ 28: Using a protractor, find the measure of the angle shown.



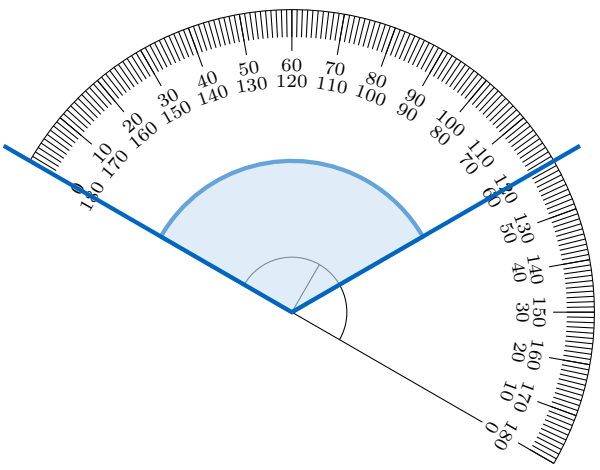
☐ 30°

☐ 50°

☐ 90°

☒ 120°

Answer: To measure an angle with a protractor, place its center on the vertex and align one ray with the 0° mark. The other ray points to the angle's measure on the protractor's scale.



Here, one ray aligns with 0°, and the other points to 120°, so the angle measures 120°.

C.3 CONSTRUCTING ANGLES

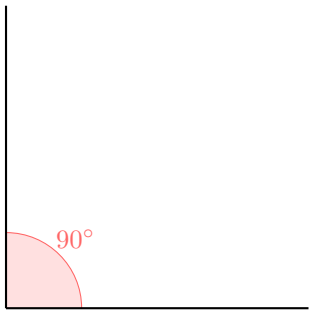
Ex 29: Using a pencil, a ruler, and a protractor, draw an angle that measures 90°.

Students should draw two rays forming an angle that measures 90°.

Answer: To draw a 90° angle:

1. Draw a ray using a ruler to create the first side of the angle.
2. Place the protractor's center on the endpoint of the ray (the vertex) and align the baseline with the ray at 0°.
3. Mark a point at 90° on the protractor's scale.
4. Remove the protractor and use the ruler to draw a second ray from the vertex through the marked point.

The resulting angle measures 90°, as shown below.



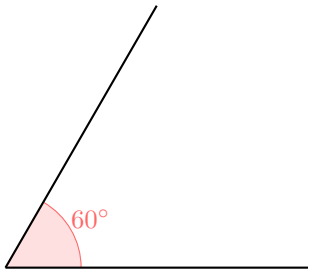
Ex 30: Using a pencil, a ruler, and a protractor, draw an angle that measures 60°.

Students should draw two rays forming an angle that measures 60°.

Answer: To draw a 60° angle:

1. Draw a ray using a ruler to create the first side of the angle.
2. Place the protractor's center on the endpoint of the ray (the vertex) and align the baseline with the ray at 0°.
3. Mark a point at 60° on the protractor's scale.
4. Remove the protractor and use the ruler to draw a second ray from the vertex through the marked point.

The resulting angle measures 60°, as shown below.



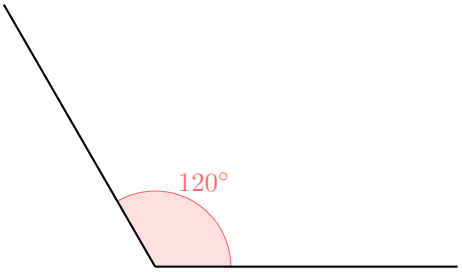
Ex 31: Using a pencil, a ruler, and a protractor, draw an angle that measures 120°.

Students should draw two rays forming an angle that measures 120°.

Answer: To draw a 120° angle:

1. Draw a ray using a ruler to create the first side of the angle.
2. Place the protractor's center on the endpoint of the ray (the vertex) and align the baseline with the ray at 0°.
3. Mark a point at 120° on the protractor's scale.
4. Remove the protractor and use the ruler to draw a second ray from the vertex through the marked point.

The resulting angle measures 120°, as shown below.



Ex 32: Using a pencil, a ruler, and a protractor, draw an angle that measures 45°.

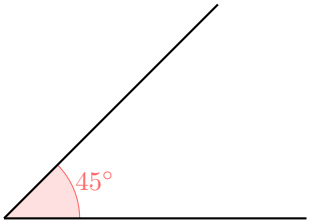
Students should draw two rays forming an angle that measures 45°.

Answer: To draw a 45° angle:

1. Draw a ray using a ruler to create the first side of the angle.
2. Place the protractor's center on the endpoint of the ray (the vertex) and align the baseline with the ray at 0°.

3. Mark a point at 45° on the protractor's scale.
4. Remove the protractor and use the ruler to draw a second ray from the vertex through the marked point.

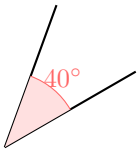
The resulting angle measures 45°, as shown below.



D CLASSIFICATION OF ANGLES

D.1 IDENTIFYING ANGLE TYPES BY MEASURE

MCQ 33: What is the nature of the marked angle?



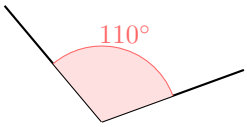
Choose one answer:

- ☒ Acute angle
- ☐ Right angle
- ☐ Obtuse angle
- ☐ Straight angle

Answer:

- An acute angle measures less than 90 degrees.
- The marked angle, measuring 40°, is acute because it is less than 90°.

MCQ 34: What is the nature of the marked angle?



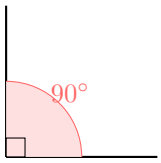
Choose one answer:

- ☐ Acute angle
- ☐ Right angle
- ☒ Obtuse angle
- ☐ Straight angle

Answer:

- An obtuse angle measures more than 90 degrees but less than 180 degrees.
- The marked angle, measuring 110°, is obtuse because it is between 90° and 180°.

MCQ 35: What is the nature of the marked angle?



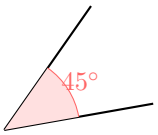
Choose one answer:

- ☐ Acute angle
- ☒ Right angle
- ☐ Obtuse angle
- ☐ Straight angle

Answer:

- A right angle measures exactly 90 degrees.
- The marked angle, measuring 90°, is a right angle.

MCQ 36: What is the nature of the marked angle?



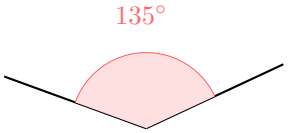
Choose one answer:

- ☒ Acute angle
- ☐ Right angle
- ☐ Obtuse angle
- ☐ Straight angle

Answer:

- An acute angle measures less than 90 degrees.
- The marked angle, measuring 45°, is acute because it is less than 90°.

MCQ 37: What is the nature of the marked angle?



Choose one answer:

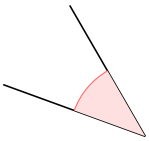
- ☐ Acute angle
- ☐ Right angle
- ☒ Obtuse angle
- ☐ Straight angle

Answer:

- An obtuse angle measures more than 90 degrees but less than 180 degrees.
- The marked angle, measuring 135°, is obtuse because it is between 90° and 180°.

D.2 IDENTIFYING ANGLE TYPES

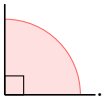
MCQ 38: Identify the type of the highlighted angle.



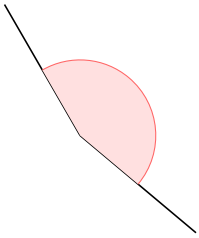
Choose one answer:

- ☒ acute angle
- ☐ right angle
- ☐ obtuse angle
- ☐ straight angle

Answer:

- An acute angle measures less than 90°.
- The highlighted angle (≈ 40°) is less open than a right angle  .
- Hence it is **acute**.

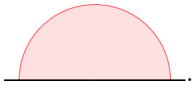
MCQ 39: Identify the type of the highlighted angle.



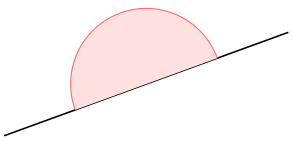
Choose one answer:

- ☐ acute angle
- ☐ right angle
- ☒ obtuse angle
- ☐ straight angle

Answer:

- An obtuse angle measures between 90° and 180°.
- The highlighted angle (≈ 160°) is more open than a right angle  but less than a straight angle  .
- Therefore it is **obtuse**.

MCQ 40: Identify the type of the highlighted angle.



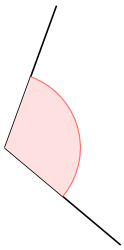
Choose one answer:

- ☐ acute angle
- ☐ right angle
- ☐ obtuse angle
- ☒ straight angle

Answer:

- A straight angle measures exactly 180°.
- The highlighted angle forms a line.
- It is therefore **straight**.

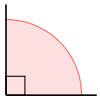
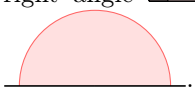
MCQ 41: Identify the type of the highlighted angle.



Choose one answer:

- ☐ acute angle
- ☐ right angle
- ☒ obtuse angle
- ☐ straight angle

Answer:

- An obtuse angle measures between 90° and 180°.
- The highlighted angle (≈ 110°) is more open than a right angle  but less open than a straight angle  .
- Therefore it is **obtuse**.

D.3 CONSTRUCTING ANGLE TYPES

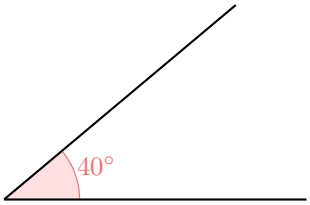
Ex 42: Using a pencil, a ruler, and a protractor, draw an acute angle.

Students should draw two rays forming an angle that measures less than 90°.

Answer: To draw an acute angle, such as a 40° angle:

1. Draw a ray using a ruler to create the first side of the angle.
2. Place the protractor's center on the endpoint of the ray (the vertex) and align the baseline with the ray at 0°.
3. Mark a point at 40° on the protractor's scale (any angle less than 90° is acceptable).
4. Remove the protractor and use the ruler to draw a second ray from the vertex through the marked point.

The resulting angle is acute, measuring less than 90°, as shown below.



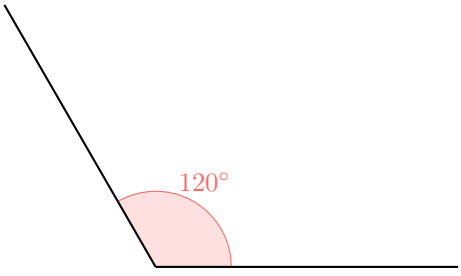
Ex 43: Using a pencil, a ruler, and a protractor, draw an obtuse angle.

Students should draw two rays forming an angle that measures greater than 90° but less than 180°.

Answer: To draw an obtuse angle, such as a 120° angle:

1. Draw a ray using a ruler to create the first side of the angle.
2. Place the protractor's center on the endpoint of the ray (the vertex) and align the baseline with the ray at 0°.
3. Mark a point at 120° on the protractor's scale (any angle greater than 90° but less than 180° is acceptable).
4. Remove the protractor and use the ruler to draw a second ray from the vertex through the marked point.

The resulting angle is obtuse, measuring greater than 90° but less than 180°, as shown below.



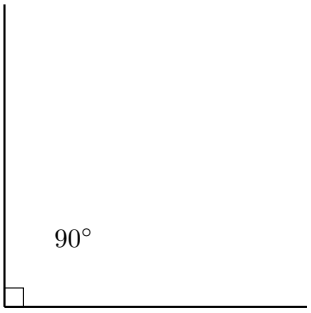
Ex 44: Using a pencil, a ruler, and a protractor, draw a right angle.

Students should draw two rays forming an angle that measures exactly 90°.

Answer: To draw a right angle, which measures 90°:

1. Draw a ray using a ruler to create the first side of the angle.
2. Place the protractor's center on the endpoint of the ray (the vertex) and align the baseline with the ray at 0°.
3. Mark a point at 90° on the protractor's scale.
4. Remove the protractor and use the ruler to draw a second ray from the vertex through the marked point.

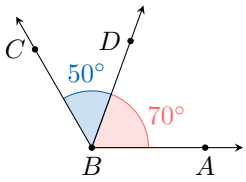
The resulting angle is a right angle, measuring exactly 90°, as shown below.



E ANGLE ADDITION

E.1 ADDING ANGLES

Ex 45: Calculate the measure of $\angle ABC$.

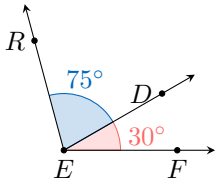


$\angle ABC =$ 120 °

Answer: Using the angle addition postulate, $\angle ABC$ is the sum of the smaller angles $\angle ABD$ and $\angle DBC$:

$$\begin{aligned}\angle ABC &= \angle ABD + \angle DBC \\ &= 70° + 50° \\ &= 120°\end{aligned}$$

Ex 46: Calculate the measure of $\angle FER$.

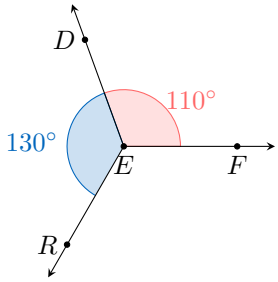


$\angle FER =$ 105 °

Answer: Using the angle addition postulate, $\angle FER$ is the sum of the smaller angles $\angle FED$ and $\angle DER$:

$$\begin{aligned}\angle FER &= \angle FED + \angle DER \\ &= 30° + 75° \\ &= 105°\end{aligned}$$

Ex 47: Calculate the measure of $\angle FER$.

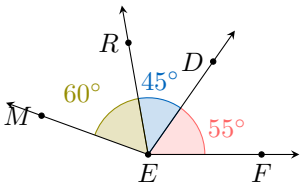


$\angle FER =$ 240 °

Answer: Using the angle addition postulate, $\angle FER$ is the sum of the smaller angles $\angle FED$ and $\angle DER$:

$$\begin{aligned}\angle FER &= \angle FED + \angle DER \\ &= 110° + 130° \\ &= 240°\end{aligned}$$

Ex 48: Calculate the measure of $\angle FEM$.

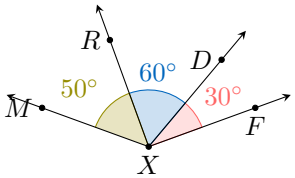


$\angle FEM =$ 160 °

Answer: Using the angle addition postulate, $\angle FEM$ is the sum of the smaller angles $\angle FED$, $\angle DER$, and $\angle REM$:

$$\begin{aligned}\angle FEM &= \angle FED + \angle DER + \angle REM \\ &= 55° + 45° + 60° \\ &= 160°\end{aligned}$$

Ex 49: Calculate the measure of $\angle FXM$.

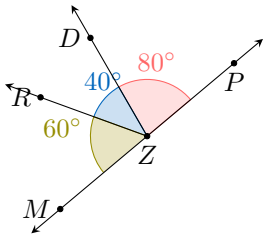


$\angle FXM =$ 140 °

Answer: Using the angle addition postulate, $\angle FXM$ is the sum of the smaller angles $\angle FXD$, $\angle DXR$, and $\angle RXM$:

$$\begin{aligned}\angle FXM &= \angle FXD + \angle DXR + \angle RXM \\ &= 30° + 60° + 50° \\ &= 140°\end{aligned}$$

Ex 50: Calculate the measure of $\angle MZP$.



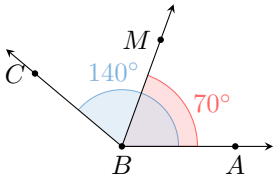
$\angle MZP =$ 180 °

Answer: Using the angle addition postulate, $\angle MZP$ is the sum of the smaller angles $\angle MZR$, $\angle RZD$, and $\angle DZP$:

$$\begin{aligned}\angle MZP &= \angle MZR + \angle RZD + \angle DZP \\ &= 60° + 40° + 80° \\ &= 180°\end{aligned}$$

E.2 SUBTRACTING ANGLE

Ex 51: Calculate the measure of $\angle CBM$.



$\angle CBM =$ 70 °

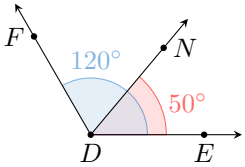
Answer: Using the angle addition postulate, the larger angle is the sum of the smaller angles:

$$\angle CBM + \angle MBA = \angle CBA$$

To find $\angle CBM$, subtract $\angle MBA$ from $\angle CBA$:

$$\begin{aligned}\angle CBM &= \angle CBA - \angle MBA \\ &= 140° - 70° \\ &= 70°\end{aligned}$$

Ex 52: Calculate the measure of $\angle FDN$.



$\angle FDN =$ 70 °

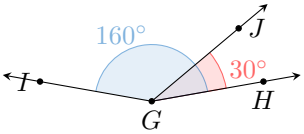
Answer: Using the angle addition postulate, the larger angle is the sum of the smaller angles:

$$\angle FDN + \angle NDE = \angle FDE$$

To find $\angle FDN$, subtract $\angle NDE$ from $\angle FDE$:

$$\begin{aligned}\angle FDN &= \angle FDE - \angle NDE \\ &= 120° - 50° \\ &= 70°\end{aligned}$$

Ex 53: Calculate the measure of $\angle IGJ$.



$\angle IGJ =$ 130 °

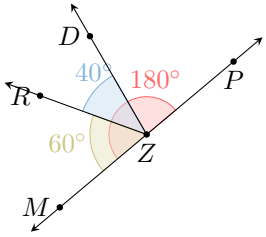
Answer: Using the angle addition postulate, the larger angle is the sum of the smaller angles:

$$\angle IGJ + \angle JGH = \angle IGH$$

To find $\angle IGJ$, subtract $\angle JGH$ from $\angle IGH$:

$$\begin{aligned}\angle IGJ &= \angle IGH - \angle JGH \\ &= 160° - 30° \\ &= 130°\end{aligned}$$

Ex 54: Calculate the measure of $\angle DZP$ by subtracting the known angles from the larger angle using the angle addition postulate.



$\angle DZP = \boxed{80}°$

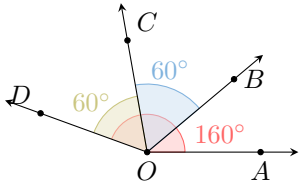
Answer: Using the angle addition postulate, the larger angle is the sum of the smaller angles:

$$\angle MZR + \angle RZD + \angle DZP = \angle MZP$$

To find $\angle DZP$, subtract $\angle MZR$ and $\angle RZD$ from $\angle MZP$:

$$\begin{aligned}\angle DZP &= \angle MZP - \angle MZR - \angle RZD \\ &= 180° - 60° - 40° \\ &= 80°\end{aligned}$$

Ex 55: Calculate the measure of $\angle AOB$ by subtracting the known angles from the larger angle using the angle addition postulate.



$\angle AOB = \boxed{40}°$

Answer: Using the angle addition postulate, the larger angle is the sum of the smaller angles:

$$\angle AOB + \angle BOC + \angle COD = \angle AOD$$

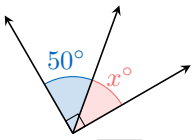
To find $\angle AOB$, subtract $\angle BOC$ and $\angle COD$ from $\angle AOD$:

$$\begin{aligned}\angle AOB &= \angle AOD - \angle BOC - \angle COD \\ &= 160° - 60° - 60° \\ &= 40°\end{aligned}$$

F ANGLE PROPERTIES

F.1 CALCULATING AN UNKNOWN ANGLE IN A RIGHT ANGLE

Ex 56: Calculate the measure of the unknown angle.

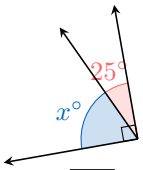


$x° = \boxed{40}°$

Answer: The sum of angles in a right angle is equal to 90°.

$$\begin{aligned}x° + 50° &= 90° \\ x° &= 90° - 50° \quad \text{(subtract 50°)} \\ &= 40°\end{aligned}$$

Ex 57: Calculate the measure of the unknown angle.

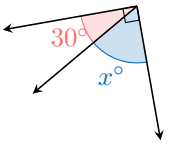


$x° = \boxed{65}°$

Answer: The sum of angles in a right angle is equal to 90°.

$$\begin{aligned}25° + x° &= 90° \\ x° &= 90° - 25° \quad \text{(subtract 25°)} \\ &= 65°\end{aligned}$$

Ex 58: Calculate the measure of the unknown angle.

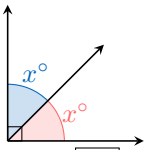


$x° = \boxed{60}°$

Answer: The sum of angles in a right angle is equal to 90°.

$$\begin{aligned}30° + x° &= 90° \\ x° &= 90° - 30° \quad \text{(subtract 30°)} \\ &= 60°\end{aligned}$$

Ex 59: Calculate the measure of the unknown angle.

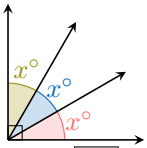


$x° = \boxed{45}°$

Answer: The sum of angles in a right angle is equal to 90°. The two angles are equal ($x°$).

$$\begin{aligned}x° + x° &= 90° \\ 2x° &= 90° \quad \text{(combine like terms)} \\ x° &= 90° \div 2 \quad \text{(divide by 2)} \\ &= 45°\end{aligned}$$

Ex 60: Calculate the measure of the unknown angle.



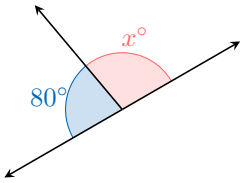
$x° = \boxed{30}°$

Answer: The sum of angles in a right angle is equal to 90°. The three angles are equal ($x°$).

$$\begin{aligned} x° + x° + x° &= 90° \\ 3x° &= 90° \quad \text{(combine like terms)} \\ x° &= 90° \div 3 \quad \text{(divide by 3)} \\ &= 30° \end{aligned}$$

F.2 CALCULATING AN UNKNOWN ANGLE IN A STRAIGHT ANGLE

Ex 61: Calculate the measure of the unknown angle.

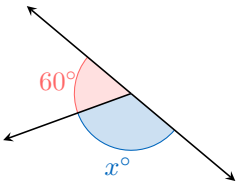


$x° = \boxed{100}°$

Answer: The sum of angles in a straight line is equal to 180°.

$$\begin{aligned} x° + 80° &= 180° \\ x° &= 180° - 80° \quad \text{(subtract 80°)} \\ &= 100° \end{aligned}$$

Ex 62: Calculate the measure of the unknown angle.

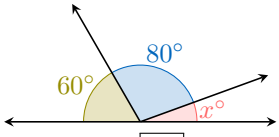


$x° = \boxed{120}°$

Answer: The sum of angles in a straight line is equal to 180°.

$$\begin{aligned} 60° + x° &= 180° \\ x° &= 180° - 60° \quad \text{(subtract 60°)} \\ &= 120° \end{aligned}$$

Ex 63: Calculate the measure of the unknown angle.

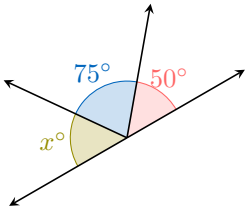


$x° = \boxed{40}°$

Answer: The sum of angles in a straight line is equal to 180°.

$$\begin{aligned} x° + 80° + 60° &= 180° \\ x° &= 180° - 80° - 60° \quad \text{(subtract 80° and 60°)} \\ &= 40° \end{aligned}$$

Ex 64: Calculate the measure of the unknown angle.

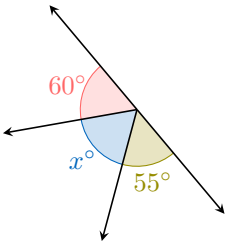


$x° = \boxed{55}°$

Answer: The sum of angles in a straight line is equal to 180°.

$$\begin{aligned} 50° + 75° + x° &= 180° \\ x° &= 180° - 50° - 75° \quad \text{(subtract 50° and 75°)} \\ &= 55° \end{aligned}$$

Ex 65: Calculate the measure of the unknown angle.

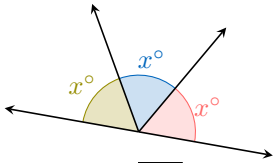


$x° = \boxed{65}°$

Answer: The sum of angles in a straight line is equal to 180°.

$$\begin{aligned} 60° + x° + 55° &= 180° \\ x° &= 180° - 60° - 55° \quad \text{(subtract 60° and 55°)} \\ &= 65° \end{aligned}$$

Ex 66: Calculate the measure of the unknown angle.



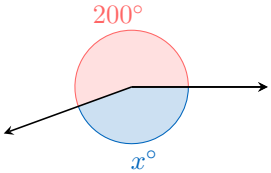
$x° = \boxed{60}°$

Answer: The sum of angles in a straight line is equal to 180°. The three angles are equal ($x°$).

$$\begin{aligned} x° + x° + x° &= 180° \\ 3x° &= 180° \quad \text{(combine like terms)} \\ x° &= 180° \div 3 \quad \text{(divide by 3)} \\ &= 60° \end{aligned}$$

F.3 CALCULATING AN UNKNOWN ANGLE IN A FULL ANGLE

Ex 67: Calculate the measure of the unknown angle.

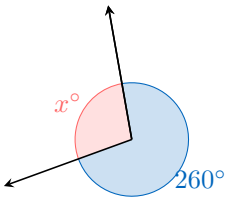


$x° = \boxed{160}°$

Answer: The sum of angles in a point is equal to 360°.

$$\begin{aligned} 200° + x° &= 360° \\ x° &= 360° - 200° \quad \text{(subtract 200°)} \\ &= 160° \end{aligned}$$

Ex 68: Calculate the measure of the unknown angle.

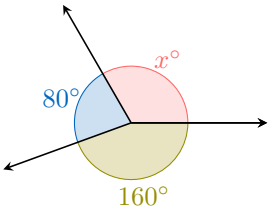


$x° = \boxed{100}°$

Answer: The sum of angles in a point is equal to 360°.

$$\begin{aligned} x° + 260° &= 360° \\ x° &= 360° - 260° \quad \text{(subtract 260°)} \\ &= 100° \end{aligned}$$

Ex 69: Calculate the measure of the unknown angle.

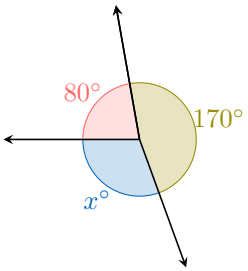


$x° = \boxed{120}°$

Answer: The sum of angles in a point is equal to 360°.

$$\begin{aligned} x° + 80° + 160° &= 360° \\ x° &= 360° - 80° - 160° \quad \text{(subtract 80° and 160°)} \\ &= 120° \end{aligned}$$

Ex 70: Calculate the measure of the unknown angle.

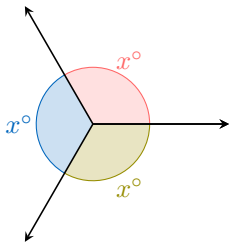


$x° = \boxed{110}°$

Answer: The sum of angles in a point is equal to 360°.

$$\begin{aligned} 80° + x° + 170° &= 360° \\ x° &= 360° - 80° - 170° \quad \text{(subtract 80° and 170°)} \\ &= 110° \end{aligned}$$

Ex 71: Calculate the measure of the unknown angle.



$x° = \boxed{120}°$

Answer: The sum of angles in a point is equal to 360°. The three angles are equal ($x°$).

$$\begin{aligned} x° + x° + x° &= 360° \\ 3x° &= 360° \quad \text{(combine like terms)} \\ x° &= 360° \div 3 \quad \text{(divide by 3)} \\ &= 120° \end{aligned}$$