ANGLES

A WHAT IS AN ANGLE?
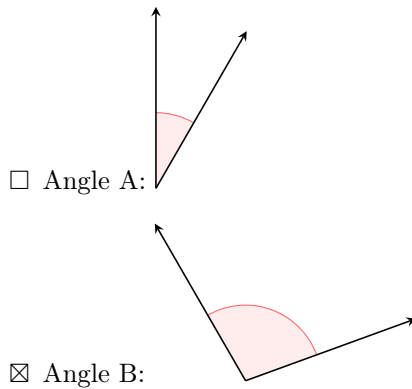
A.1 COMPARING ANGLES

MCQ 1: Which angle has the greater measure?
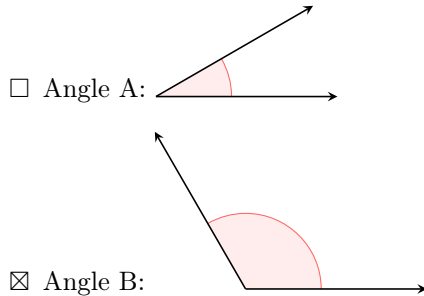
☐ Angle A:

☒ 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?
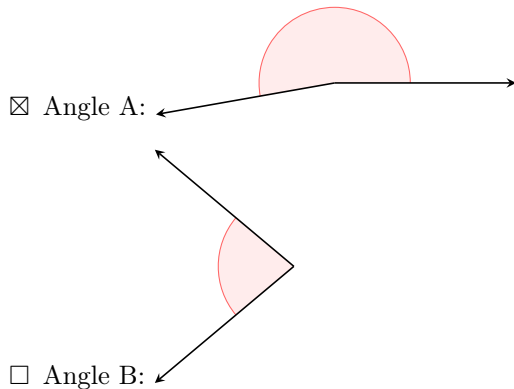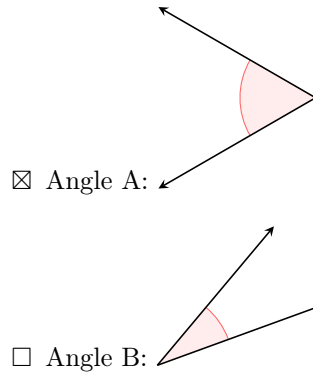
☐ Angle A:

☒ 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?
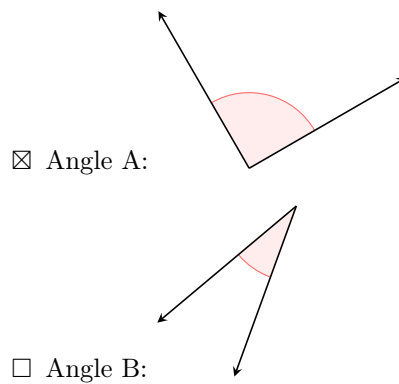
☒ Angle A:

☐ 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.
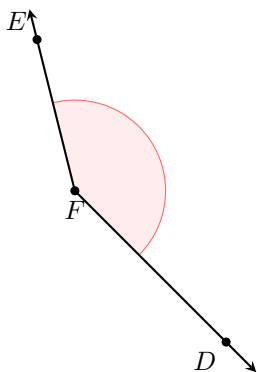
A.2 NAMING ANGLES WITH THREE POINTS

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

☐ $\angle DEF$

☒ $\angle FDE$

☐ $\angle DFE$
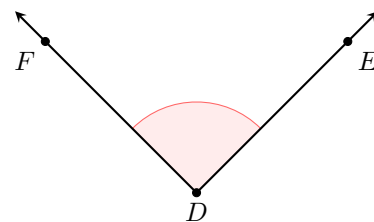
Answer: The marked angle has vertex D, with points E and F on its sides. In three-point notation, the vertex is in the middle, so the correct name is $\angle FDE$.
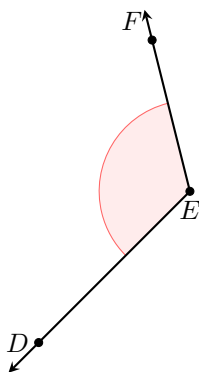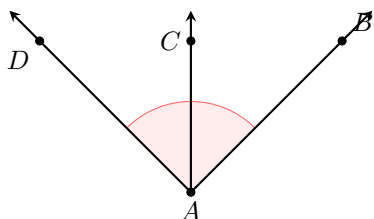
MCQ 7: Which option correctly names the marked angle using three-point notation?

☐ ∠DEF

☐ ∠FDE

☒ ∠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 ∠DFE.

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

☒ ∠DEF

☐ ∠FDE

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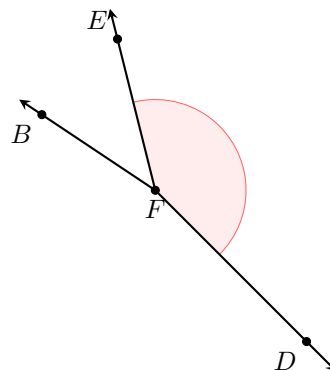
MCQ 9: Which option correctly names the marked angle using three-point notation?

☐ ∠ADC

☐ ∠CAB

☒ ∠DAB

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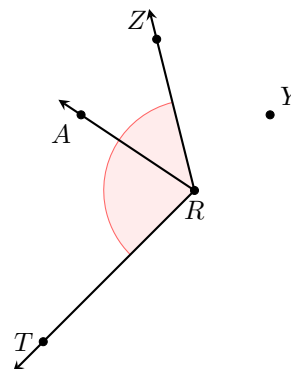
MCQ 10: Which option correctly names the marked angle using three-point notation?

☐ ∠BFD

☐ ∠FDE

☒ ∠DFE

☐ ∠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 ∠DFE.

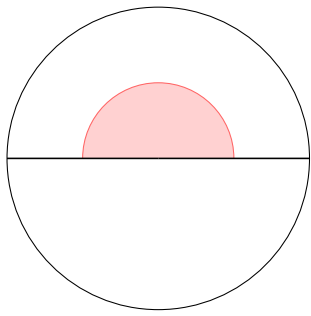**MCQ 11:** Which option correctly names the marked angle using three-point notation?

☐ ∠TRY

☒ ∠ZRT

☐ ∠ZRA

☐ ∠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 ∠ZRT.
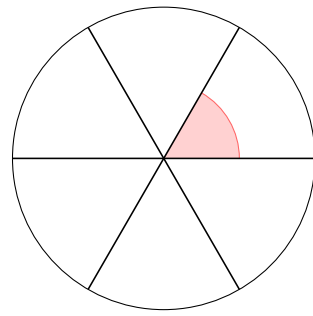
B DEGREES

B.1 DIVIDING THE FULL TURN

Ex 12:
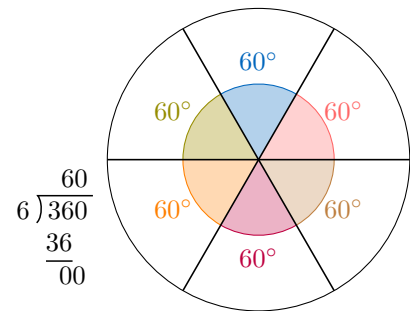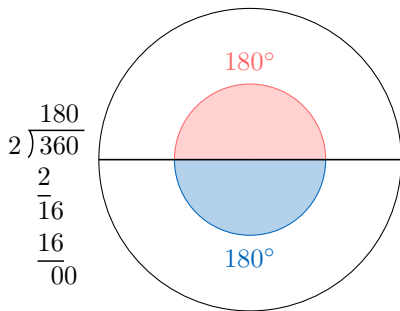
One-half of a full turn measures $\boxed{180}°$.

Answer:

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

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

180°
180°
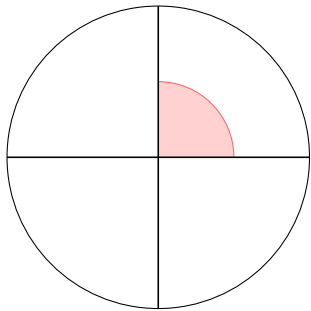
One-sixth of a full turn measures $\boxed{60}°$.

Answer:

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

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

60° 60° 60° 60° 60° 60°

Ex 13:
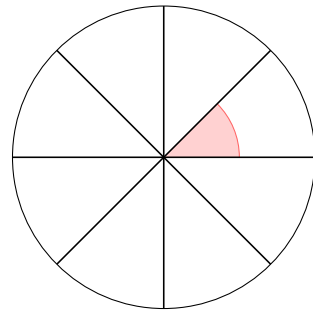
One-quarter of a full turn measures $\boxed{90}°$.

Answer:

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

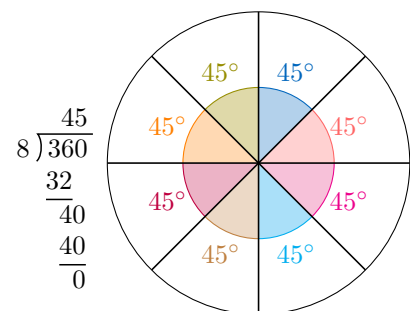$$\begin{array}{r} 90 \\ 4\overline{)360} \\ 36 \\ \overline{00} \end{array}$$

90° 90° 90° 90°

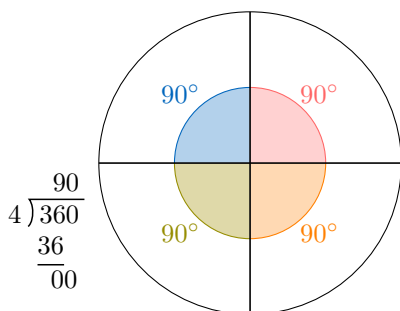**Ex 15:**

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

Answer:

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

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

45° 45° 45° 45° 45° 45° 45° 45°

Ex 14:

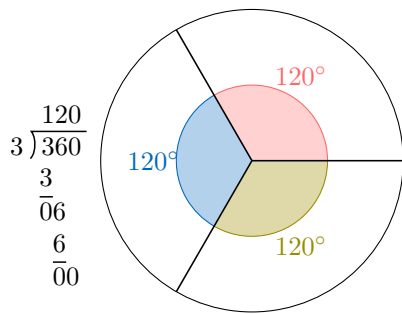**Ex 16:**
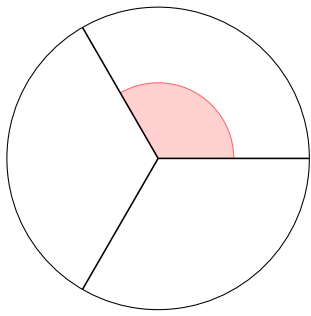
One-third of a full turn measures $\boxed{120}$°.

Answer:

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

$$3\overline{)360}^{120} \\ \underline{3} \\ 06 \\ \underline{6} \\ 00$$

C MEASURING AND DRAWING ANGLES WITH A PROTRACTOR

C.1 MEASURING ANGLES

Ex 17:
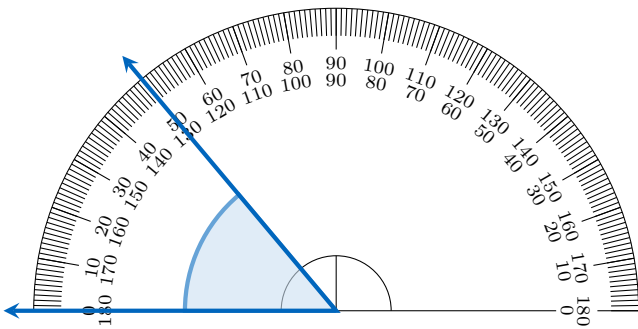
The angle shown measures $\boxed{50}$°.

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°.
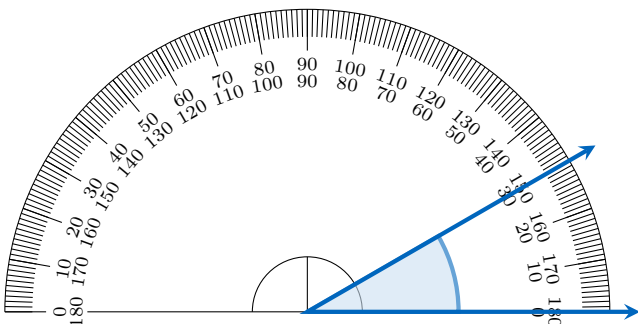
Ex 19:

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°.
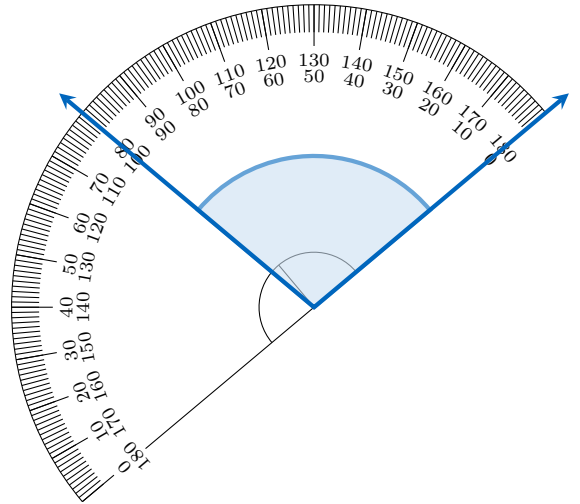
Ex 20:

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°.
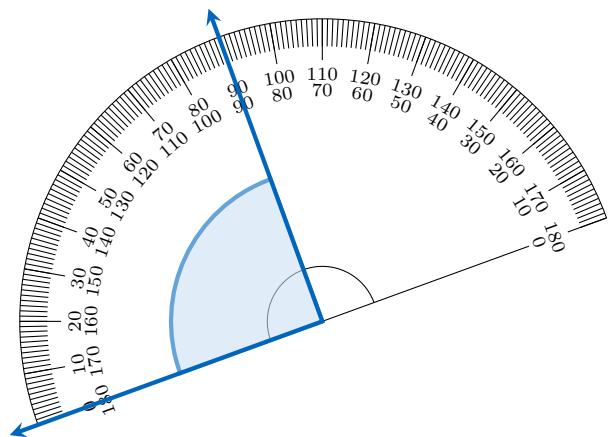
Ex 21:

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°.
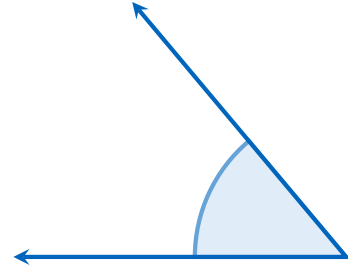
Ex 22:

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°.
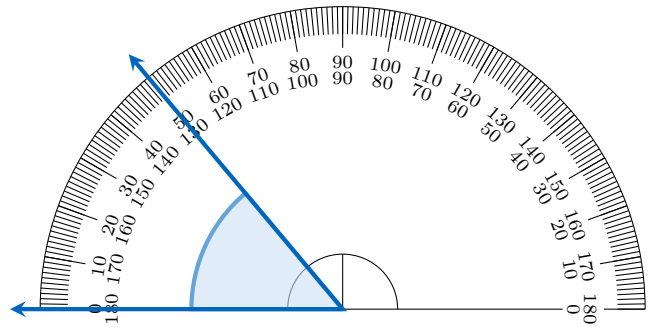
Ex 23:

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.
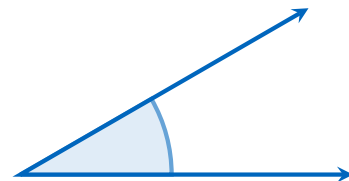

- ☐ 30°
- ☒ 50°
- ☐ 90°
- ☐ 130°

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.
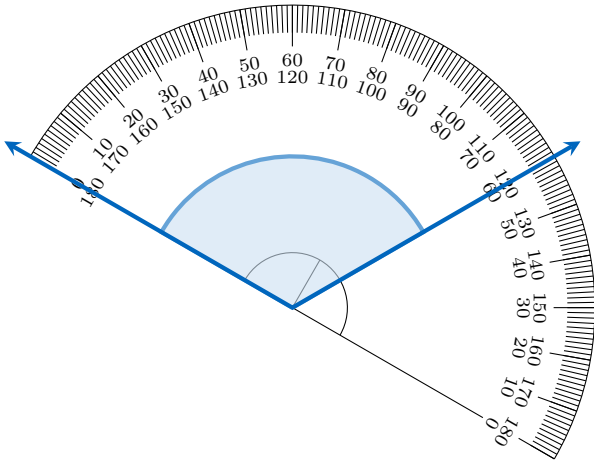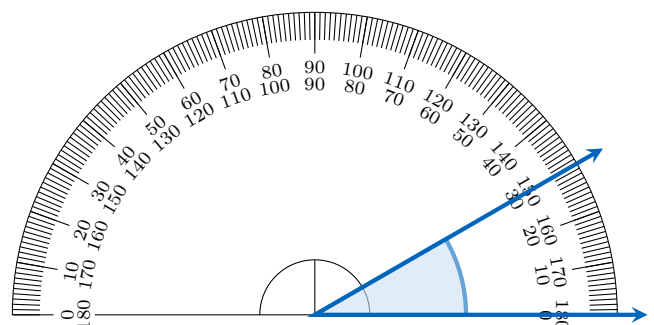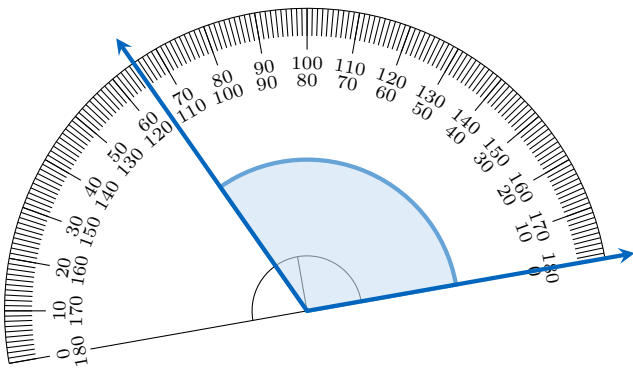

Here, one ray aligns with 0°, and the other points to 50°, so the angle measures 50°.

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.

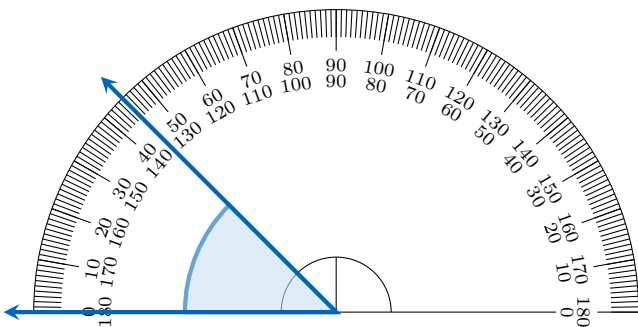Here, one ray aligns with 0°, and the other points to 30°, so the angle measures 30°.

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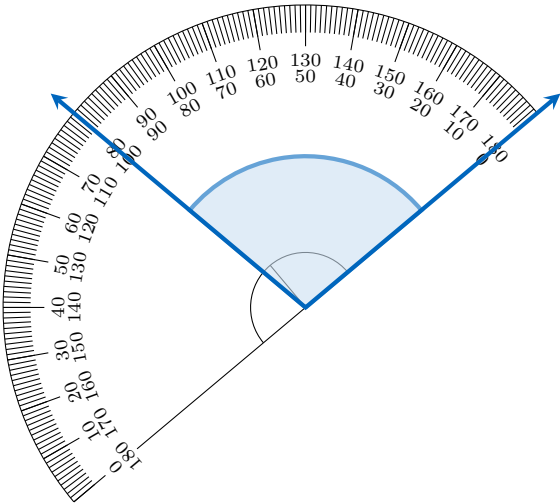

☐ 30°

☐ 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.
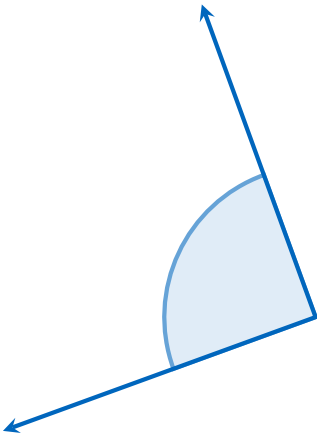

☐ 30°

☐ 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.

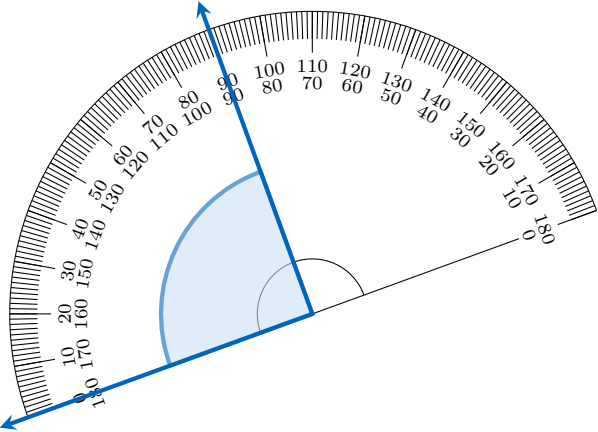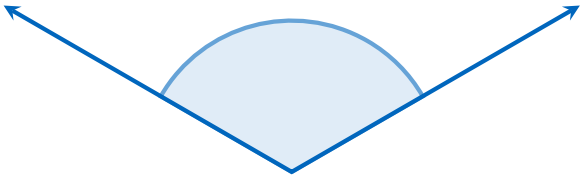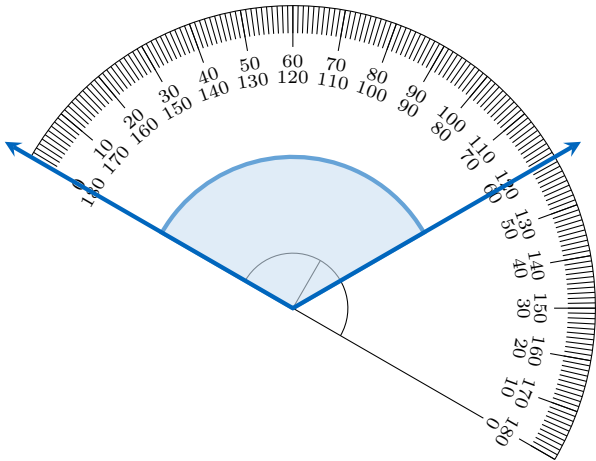Here, one ray aligns with 0°, and the other points to 120°, so the angle measures 120°.

C.3 CONSTRUCTING ANGLES

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

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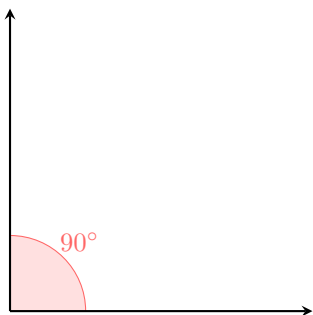
Ex 30: Using a pencil, a ruler, and a protractor, draw an angle that measures 60°.

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.
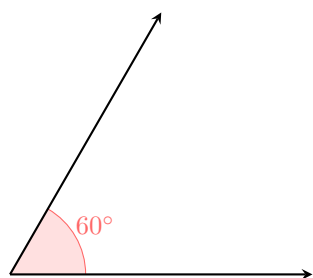
The resulting angle measures 60°, as shown below.

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

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.
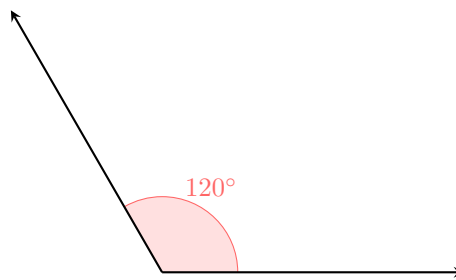
The resulting angle measures 120°, as shown below.

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

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.
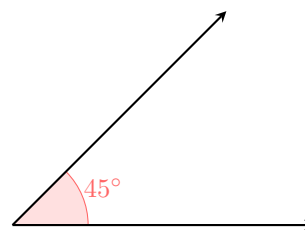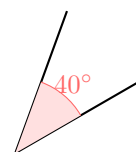
The resulting angle measures 45°, as shown below.

D CLASSIFICATION OF ANGLES

D.1 IDENTIFYING ANGLE TYPES BY MEASURE

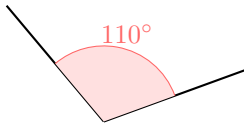**MCQ 33:** What is the nature of the marked angle?

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°.

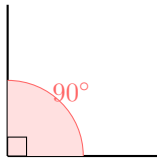**MCQ 34:** What is the nature of the marked angle?

110°

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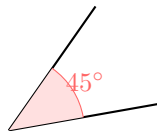
MCQ 35: What is the nature of the marked angle?

90°

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.

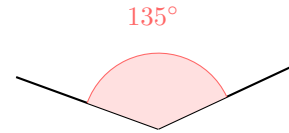**MCQ 36:** What is the nature of the marked angle?

45°

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?
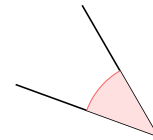

135°

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

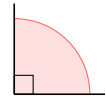**MCQ 38:** Identify the type of the highlighted angle.

Choose one answer:

☒ acute angle
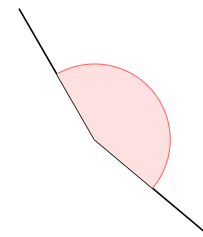
☐ right angle

☐ obtuse angle

☐ straight angle

Answer:

- An acute angle measures less than 90°.

- The highlighted angle ($\approx 40°$) 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**.

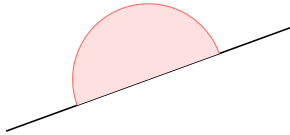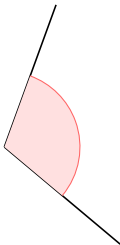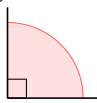**MCQ 41:** Identify the type of the highlighted angle.

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.

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.

40°
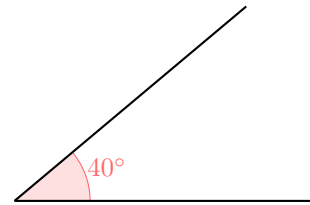
Ex 43: Using a pencil, a ruler, and a protractor, draw an obtuse angle.

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.

120°
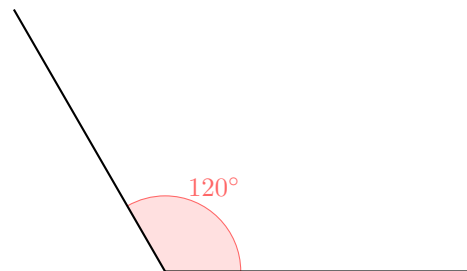
Ex 44: Using a pencil, a ruler, and a protractor, draw a right angle.

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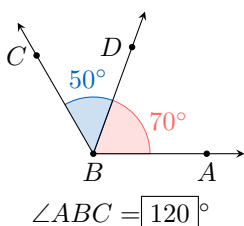
The resulting angle is a right angle, measuring exactly 90°, as shown below.

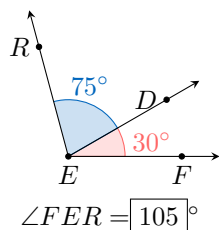$$90°$$
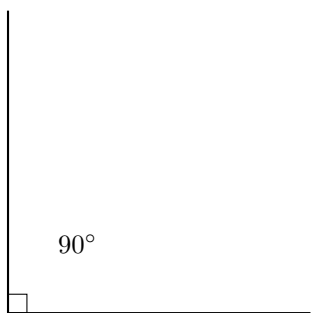
E ANGLE ADDITION

E.1 ADDING ANGLES

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

$$\angle ABC = \boxed{120}\,°$$

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

$$\angle ABC = \angle ABD + \angle DBC$$
$$= 70° + 50°$$
$$= 120°$$

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

$$\angle FER = \boxed{105}\,°$$

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

$$\angle FER = \angle FED + \angle DER$$
$$= 30° + 75°$$
$$= 105°$$

Ex 47: Calculate the measure of $\angle FER$.
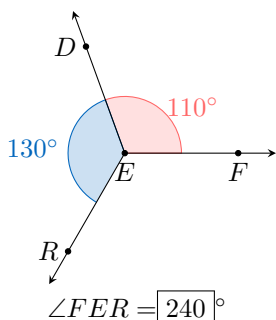
$$\angle FER = \boxed{240}\,°$$

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

$$\angle FER = \angle FED + \angle DER$$
$$= 110° + 130°$$
$$= 240°$$

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

$$\angle FEM = \boxed{160}\,°$$
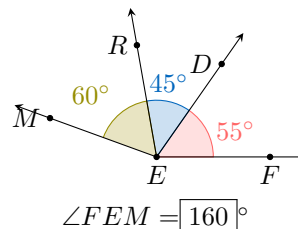
Answer: Using the angle addition postulate, $\angle FEM$ is the sum of the smaller angles $\angle FED$, $\angle DER$, and $\angle REM$:

$$\angle FEM = \angle FED + \angle DER + \angle REM$$
$$= 55° + 45° + 60°$$
$$= 160°$$

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

$$\angle FXM = \boxed{140}\,°$$
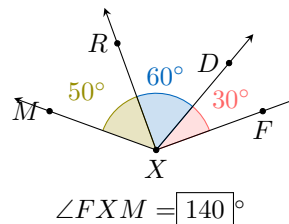
Answer: Using the angle addition postulate, $\angle FXM$ is the sum of the smaller angles $\angle FXD$, $\angle DXR$, and $\angle RXM$:

$$\angle FXM = \angle FXD + \angle DXR + \angle RXM$$
$$= 30° + 60° + 50°$$
$$= 140°$$

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

$$\angle MZP = \boxed{180}\,°$$
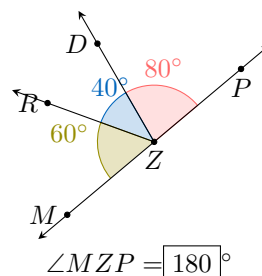
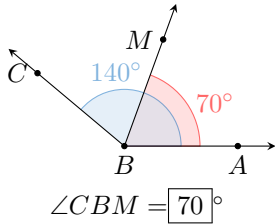*Answer:* Using the angle addition postulate, $\angle MZP$ is the sum of the smaller angles $\angle MZR$, $\angle RZD$, and $\angle DZP$:

$$\angle MZP = \angle MZR + \angle RZD + \angle DZP$$
$$= 60° + 40° + 80°$$
$$= 180°$$

E.2 SUBTRACTING ANGLES

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

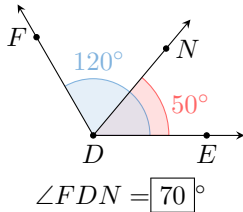$$\angle CBM = \boxed{70}°$$

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 $\angle FDN$.
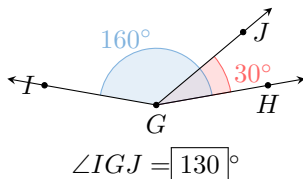

$$\angle FDN = \boxed{70}°$$

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 $\angle IGJ$.
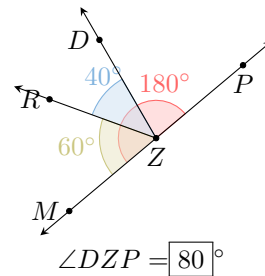

$$\angle IGJ = \boxed{130}°$$

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.
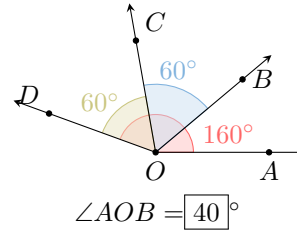

$$\angle DZP = \boxed{80}°$$

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:

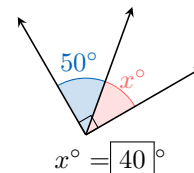$$\angle AOB + \angle BOC + \angle COD = \angle AOD$$

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
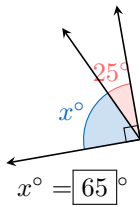
F.1 CALCULATING AN UNKNOWN ANGLE IN A RIGHT ANGLE

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°.

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

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°.

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

Ex 59: Calculate the measure of the unknown angle.

$$x° = \boxed{45}°$$
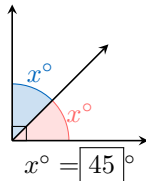
Answer: The sum of angles in a right angle is equal to 90°. The two angles are equal ($x°$).

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

Ex 60: Calculate the measure of the unknown angle.

$$x° = \boxed{30}°$$
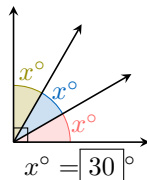
Answer: The sum of angles in a right angle is equal to 90°. The three angles are equal ($x°$).

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

F.2 CALCULATING AN UNKNOWN ANGLE IN A STRAIGHT ANGLE

Ex 61: Calculate the measure of the unknown angle.

$$x° = \boxed{100}°$$
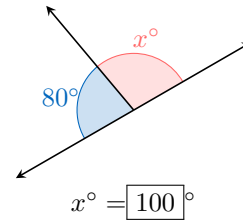
Answer: The sum of angles on a straight line is equal to 180°.

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

Ex 62: Calculate the measure of the unknown angle.

$$x° = \boxed{120}°$$
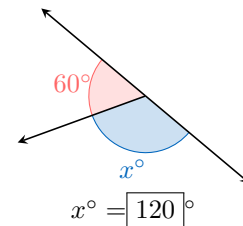
Answer: The sum of angles on a straight line is equal to 180°.

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

Ex 63: Calculate the measure of the unknown angle.

$$x° = \boxed{40}°$$
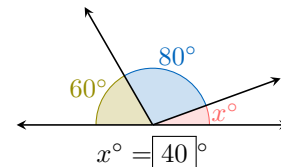
Answer: The sum of angles on a straight line is equal to 180°.

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

Ex 64: Calculate the measure of the unknown angle.

$$x° = \boxed{55}°$$
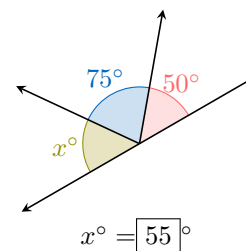
Answer: The sum of angles on a straight line is equal to 180°.

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

Ex 65: Calculate the measure of the unknown angle.

$$x° = \boxed{65}°$$
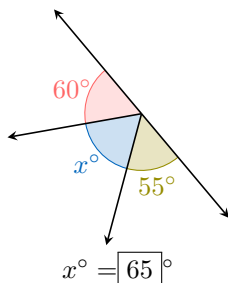
Answer: The sum of angles on a straight line is equal to 180°.

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

Ex 66: Calculate the measure of the unknown angle.

$$x° = \boxed{60}°$$
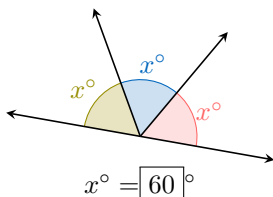
Answer: The sum of angles on a straight line is equal to 180°. The three angles are equal ($x°$).

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

F.3 CALCULATING AN UNKNOWN ANGLE IN A FULL ANGLE

Ex 67: Calculate the measure of the unknown angle.

$$x° = \boxed{160}°$$
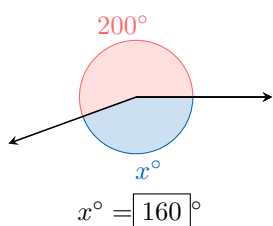
Answer: The sum of angles in a point is equal to 360°.

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

Ex 68: Calculate the measure of the unknown angle.

$$x° = \boxed{100}°$$
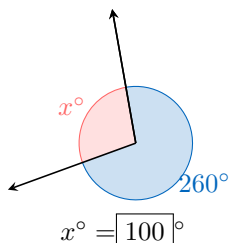
Answer: The sum of angles around a point is equal to 360°.

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

Ex 69: Calculate the measure of the unknown angle.

$$x° = \boxed{120}°$$
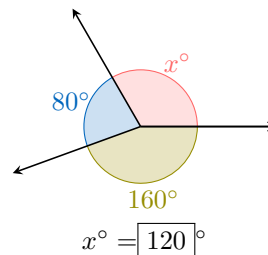
Answer: The sum of angles around a point is equal to 360°.

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

Ex 70: Calculate the measure of the unknown angle.

$$x° = \boxed{110}°$$
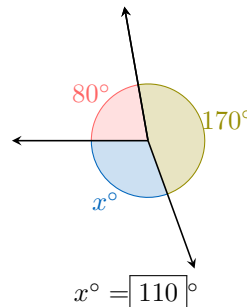
Answer: The sum of angles around a point is equal to 360°.

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

Ex 71: Calculate the measure of the unknown angle.

$$x° = \boxed{120}°$$
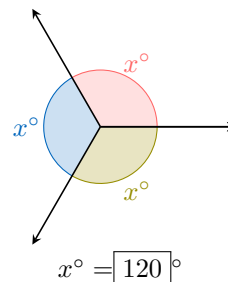
Answer: The sum of angles around a point is equal to 360°. The three angles are equal ($x°$).

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