EXERCISE 4.1

1. Use the figure to name:
(a) Five points
(b) A line
(c) Four rays
(d) Five line segments

Solutions:
(a) The five points are D, E, O, B and C
(b) A line is $\overline{BD}$
(c) Four rays are $\overrightarrow{OD}$, $\overrightarrow{OB}$, $\overrightarrow{OC}$ and $\overrightarrow{OE}$.
(d) Five line segments are $\overline{DE}$, $\overline{EO}$, $\overline{OB}$, $\overline{OC}$ and $\overline{BE}$

2. Name the line given in all possible (twelve) ways, choosing only two letters at a time from the four given.

Solutions:
The lines are $\overline{AB}$, $\overline{AC}$, $\overline{AD}$, $\overline{BA}$, $\overline{BC}$, $\overline{BD}$, $\overline{CA}$, $\overline{CB}$, $\overline{CD}$, $\overline{DA}$, $\overline{DB}$, $\overline{DC}$

3. Use the figure to name:
(a) Line containing point E.
(b) Line passing through A.
(c) Line on which O lies
(d) Two pairs of intersecting lines.
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Solutions:
(a) Line containing point E is \( \overrightarrow{AE} \)
(b) Line passing through A is \( \overrightarrow{AE} \)
(c) Line on which O lies is \( \overrightarrow{OC} \)
(d) Two pairs of intersecting lines are \( \overrightarrow{CO}, \overrightarrow{AE} \) and \( \overrightarrow{AE}, \overrightarrow{EF} \)

4. How many lines can pass through (a) one given point? (b) two given points?
Solutions:
(a) Countless lines can pass through a given point.
(b) Only one line can pass through a two given points.

5. Draw a rough figure and label suitably in each of the following cases:
(a) Point P lies on \( \overrightarrow{AB} \).
(b) \( \overrightarrow{XY} \) and \( \overrightarrow{PQ} \) intersect at M.
(c) Line l contains E and F but not D.
(d) \( \overrightarrow{OP} \) and \( \overrightarrow{OQ} \) meet at O.
Solutions:
(a)
6. Consider the following figure of line \( \overrightarrow{MN} \). Say whether following statements are true or false in context of the given figure.

(a) Q, M, O, N, P are points on the line \( \overrightarrow{MN} \).
(b) M, O, N are points on a line segment \( \overline{MN} \).
(c) M and N are end points of line segment \( \overline{MN} \).
(d) O and N are end points of line segment \( \overline{OP} \).
(e) M is one of the end points of line segment \( \overline{OQ} \).
(f) M is point on ray \( \overrightarrow{OP} \).
(g) Ray \( \overrightarrow{OP} \) is different from ray \( \overrightarrow{QP} \).
(h) Ray \( \overrightarrow{OP} \) is same as ray \( \overrightarrow{OM} \).
(i) Ray \( \overrightarrow{OM} \) is not opposite to ray \( \overrightarrow{OP} \).
(j) O is not an initial point of \( \overrightarrow{OP} \).
(k) N is the initial point of \( \overrightarrow{NP} \) and \( \overrightarrow{NM} \).

**Solutions:**
(a) True
(b) True
(c) True
(d) False
(e) False
(f) False
(g) True
(h) False
(i) False
(j) False
(k) True