

## CHEMISTRY ONLINE

- TUITION -

Phone: +442081445350
www.chemistryonlinetuition.com

## Emil:asherrana@chemistryonlinetuition.com

## PURE MATH

## ALGEBRA AND FUNCTION

TOPIC:

```
SIMULTANEOUS
```8 individual/ company/organization involved in copyright abuse.
Q. 1

Given
\[
\begin{aligned}
& y=2 x \rightarrow(i) \\
& y=x+10 \rightarrow(i i)
\end{aligned}
\]

We take the equation and substitute 2 x for y
\[
\begin{aligned}
& 2 x=x+10 \\
& x=10 \quad \text { put in (ii) } \\
& y=10+10 \\
& y=20
\end{aligned}
\]

So,
\[
\text { s. } s=\{10,20\}
\]

\section*{Q. 2}

As
\[
\begin{aligned}
& 5 x-2 y=31 \rightarrow(i) \\
& 4 x+3 y=11 \rightarrow(i i)
\end{aligned}
\]
(i) \(\times 3\)
(ii) \(\times 2\)
\[
\begin{aligned}
& 15 x-6 y=93 \\
& 8 x+6 y=22
\end{aligned}
\]

Adding Both equation
\[
\begin{aligned}
& 23 x=115 \\
& x=5 \quad \text { put in (ii) } \\
& 20+3 y=11 \\
& 3 y=-9 \\
& y=-3
\end{aligned}
\]

So, the solution is \(x=5, y=-3\)

As
\[
\begin{aligned}
& 7 x-2 y=45 \rightarrow(i) \\
& 5 x+y=37 \rightarrow(i i)
\end{aligned}
\]
(ii) \(\times 2\)
\[
10 x+2 y=74 \rightarrow(i i i)
\]

Adding (i) and (iii)
\[
\begin{array}{ll} 
& 7 x-2 y=45 \\
\Rightarrow & 10 x+2 y=74 \\
& 17 x=119 \\
x=7 \\
& \text { Put in (ii) } \\
& 5(7)+y=37 \\
& y=37-35 \\
y=2
\end{array}
\]

Hence,
\[
\text { s.s }=\{x=7, y=2\}
\]

\section*{Q. 4}

Let \(\quad \begin{aligned} & x-2 y=8 \rightarrow(i) \\ & 2 x+y=5 \rightarrow(i i)\end{aligned}\)
(ii) \(\times 2\)
\[
4 x+2 y=10 \rightarrow(i i i)
\]

Adding (i) and (iii)
\[
\begin{aligned}
& 5 x=18 \\
& x=\frac{18}{5} \quad \text { put in (ii) } \\
& 2\left(\frac{18}{5}\right)+y=5 \\
& y=5-\frac{36}{5} \\
& y=\frac{25-36}{5} \\
& y=\frac{-11}{5}
\end{aligned}
\]

Hence,
S. \(s=\left\{\frac{18}{5}, \frac{-11}{5}\right\}\)
Q. 5
\[
\begin{aligned}
& x+2 y=-4 \rightarrow(i) \\
& 2 x+5 y=1 \rightarrow(i i)
\end{aligned}
\]
(i) \(\times 2\)
\[
2 x+4 y=-8 \rightarrow(i i i)
\]

Sub (ii) and (iii)
\[
\begin{aligned}
& 2 x+5 y=1 \\
& -(2 x+4 y=-8) \\
& y=9
\end{aligned}
\]

Put in (i)
\[
\begin{aligned}
& x+2(9)=-4 \\
& x+18=-4 \\
& x=-4-18 \\
& x=-22
\end{aligned}
\]

So,
\[
\text { s. } s=\{-22,9\}
\]

\section*{Q. 6}

Let
\(2 x+y=5 \rightarrow(i)\)
\(x+3 y=5 \rightarrow(i i)\)
(i) \(\times 3\), we have
\(6 x+3 y=15 \rightarrow(i i i)\)
Sub (ii) and (iii)
\[
\begin{aligned}
& -5 x=-10 \\
& x=2 \quad \text { Put in (ii) } \\
& 2+3 y=5 \\
& y=1
\end{aligned}
\]

So,
\[
\text { s. } s=\{2,1\}
\]
Q. 7

Let
\[
\begin{aligned}
& 3 x+y=18 \rightarrow(i) \\
& 4 x+2 y=21 \rightarrow(i i)
\end{aligned}
\]
(i) \(\times 2\)
\[
6 x+2 y=36
\]

Subtract (ii) and (iii), we get
\[
\begin{array}{ll}
\Rightarrow & -2 x=-15 \\
\Rightarrow & x=\frac{15}{2} \\
\Rightarrow & x=7.5
\end{array}
\]

Substitute \(x=7.5\) in (i)
\[
\begin{aligned}
& 3(7.5)+y=18 \\
& y=-45
\end{aligned}
\]

Hence
\[
\text { s. } s=\{7,5,-4.5\}
\]

\section*{Q. 8}

As
\[
\begin{aligned}
& x+y=7 \rightarrow(i) \\
& x+2 y=11 \rightarrow(i i)
\end{aligned}
\]

Subtract (i) and (ii), we get
\[
\begin{aligned}
& \Rightarrow \quad-y=-4 \\
& \Rightarrow \quad y=4
\end{aligned}
\]

Put in (i)
\[
\begin{array}{ll}
\Rightarrow & x+4=7 \\
\Rightarrow & x=7-4 \\
\Rightarrow & x=3
\end{array}
\]

Hence,
\[
\text { s. } s=\{3,4\}
\]

- Founder \& CEO of Chemistry Online Tuition Ltd.
- Tutoring students in UK and worldwide since 2008
- CIE \& EDEXCEL Examiner since 2015
- Chemistry, Physics, and Math's Tutor

\section*{CONTACT INFORMATION FOR CHEMISTRY ONLINE TUITION}
- UK Contact: 02081445350
- International Phone/WhatsApp: 00442081445350
- Website: www.chemistryonlinetuition.com
- Email: asherrana@chemistryonlinetuition.com

Address: 210-Old Brompton Road, London SW5 OBS, UK```

