Introduction to LaTeX

ANSWERS TO EXERCISE 2

1.
```
\[
x_1,x_2 =\frac{-\beta\pm\sqrt{\alpha^2-4\cdot\alpha\omega\cdot\gamma}}
              {2\alpha\omega}\,,
\qquad (\alpha^2-4\alpha\omega\gamma)>0.
\]
```

2.
```
\begin{align}
             x^2+2x-15 &=  0, \\
\Rightarrow (x+5)(x-3) &=  0, \nonumber \\
\Rightarrow         x  &=  -5,\,3.
\end{align}
```

3.
```
\[
\sin 30^{\circ}= \frac{1}{2} = \frac{1}{\sqrt{3}} \sin 60^{\circ}
=\cos(\pi/3).
\]
```

4.
```
\[
\arccos x= \int_x^1 \frac{\mathrm{d}u}{\sqrt{1-u^2}}\,.
\]
```

5.
```
\[
n^\mathrm{th}, \qquad 1^\mathrm{st}, \qquad 2^\mathrm{nd}.
\]
```

6.
```
\newcommand\fork{\mathrm{Fork}\,}
```

7.
```
\[
\begin{pmatrix}F[1,1] & \cdots & F[1,m] \\
         \vdots & \ddots & \vdots \\
         F[n,1] & \cdots & F[n,m] \\
\end{pmatrix}
\]
```

   OR

```
\[
\left(
\begin{array}{ccc}
 F[1,1] & \cdots & F[1,m] \\
 \vdots & \ddots & \vdots \\
 F[n,1] & \cdots & F[n,m]
\end{array}
\right)
\]
```

8. ```
   \[
   \alpha = \frac{e^2}{2h\epsilon_0 c}\approx \frac{1}{137}\,,
   \quad k = 1.38 \times 10^{-23}\ \mathrm{J}\,\mathrm{K}^{-1}.
   \]
   ```

9. ```
   \begin{align*}
   f(x) & = \frac{a_0}{2} +
              \sum_{n=1}^\infty (a_n\cos nx + b_n\sin nx)\,, \\
   a_n & =  \frac{1}{\pi} \int_{-\pi}^\pi f(x)\cos nx \,\mathrm{d}x \,,
               \quad n=1,2,\ldots\,, \\
   b_n & =  \frac{1}{\pi} \int_{-\pi}^\pi f(x)\sin nx \,\mathrm{d}x \,,
              \quad n=1,2,\ldots\,. \\
   \end{align*}
   ```

10. ```
    \newenvironment{proof}{{\scshape Proof. }\slshape}
       {\hfill {\rm Q.E.D.}\par}
    ```

11. ```
    \newcommand\defint[1]{\left [ #1 \right ]^{\frac{\pi}{2}}_0}
    ```

12. ```
    \newcommand\defint[3]{\left [ #1 \right ]^{#3}_{#2}}
    ```
    ```