

1) Given that

$$Y = c(d + e)$$

where,

$c = 6.8$ correct to 1 decimal place

$d = 4$ correct to 1 significant figure

$e = 30$ correct to the nearest 5

Work out the lower bound for the value of Y .

$$\begin{aligned} Y_{\text{lower}} &= c_{\text{lower}}(d_{\text{lower}} + e_{\text{lower}}) \\ &= 6.75(3.5 + 27.5) \\ &= \mathbf{209.25} \end{aligned}$$

2) Given that

$$N = \frac{g-h}{2}$$

where,

$g = 5.6$ correct to 2 significant figures

$h = 0.4$ correct to 1 decimal place

Work out the upper bound for the value of N .

$$\begin{aligned} N_{\text{upper}} &= \frac{g_{\text{upper}} - h_{\text{lower}}}{2} \\ &= \frac{5.65 - 0.35}{2} \\ &= \mathbf{2.65} \end{aligned}$$

3) Given that

$$X = k - 2l$$

where,

$k = 20.34$ correct to 2 decimal places

$l = 3$ correct to the nearest unit

Work out the lower bound for the value of X .

$$\begin{aligned} X_{\text{lower}} &= k_{\text{lower}} - 2(l_{\text{upper}}) \\ &= 20.335 - 2(3.5) \\ &= \mathbf{13.335} \end{aligned}$$

4) Given that

$$Z = \frac{2t-u}{v}$$

where,

$t = 7.8$ correct to 1 decimal place

$u = 3.50$ correct to 2 decimal places

$v = 2$ correct to one significant figure

Work out the upper bound for the value of Z .
Give your answer to 2 decimal places.

$$\begin{aligned} Z_{\text{upper}} &= \frac{2(t_{\text{upper}}) - u_{\text{lower}}}{v_{\text{lower}}} \\ &= \frac{2(7.85) - 3.495}{1.5} \\ &= 8.136 \dots \\ &= \mathbf{8.14 \text{ (2 dp)}} \end{aligned}$$

5) Given that

$$C = x^2 + \frac{y}{z}$$

where,

$x = 4.3$ correct to 1 decimal place

$y = 25.6$ correct to 3 significant figures

$z = 5$ correct to the nearest unit

Work out the upper bound for the value of C .

$$\begin{aligned} C_{\text{upper}} &= (x_{\text{upper}})^2 + \frac{y_{\text{upper}}}{z_{\text{lower}}} \\ &= (4.35)^2 + \frac{25.65}{4.5} \\ &= \mathbf{24.6225} \end{aligned}$$

6) Given that $R = \frac{j}{m-n}$

$j = 42$ correct to 2 significant figures

$m = 3.10$ correct to 2 decimal places

$n = 0.4$ correct to 1 significant figure

Work out the lower bound for the value of R .

Give your answer to 3 significant figures.

$$R_{lower} = \frac{j_{lower}}{m_{upper} - n_{lower}}$$

$$= \frac{41.5}{3.105 - 0.35}$$

$$= 15.0635 \dots$$

$$= \mathbf{15.1 \text{ (3 sf)}}$$

7) Given that $T = a \left(b + \frac{c^3}{2} \right)$

$a = 5.4$ correct to 1 decimal place

$b = 30$ correct to 2 significant figures

$c = 1.45$ correct to 2 decimal places

Work out the upper bound of T .

Give your answer to 2 decimal places.

$$T_{upper} = a_{upper} \left(b_{upper} + \frac{(c_{upper})^3}{2} \right)$$

$$= 5.45 \left(30.5 + \frac{1.455^3}{2} \right)$$

$$= 174.618 \dots$$

$$= \mathbf{174.62 \text{ (2 dp)}}$$

8) Given that $D = a - \frac{b}{c}$

$a = 6.45$ correct to 2 decimal places

$b = 1.9$ correct to 1 decimal place

$c = 10$ correct to the nearest 5

Work out the upper bound of D .

Give your answer to 2 decimal places.

$$D_{upper} = a_{upper} - \frac{b_{lower}}{c_{upper}}$$

$$= 6.455 - \frac{1.85}{12.5}$$

$$= 6.307$$

$$= \mathbf{6.31 \text{ (2 dp)}}$$