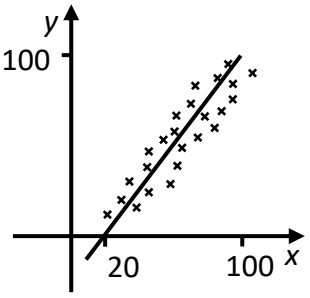
STATISTICS EXAMPLE 5

Which of the following equations relates to the line of regression shown in the diagram?

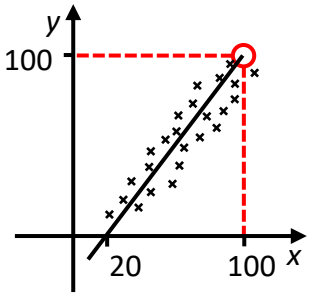


(A) $y=\frac{5}{4}x-25$ (B) $y=\frac{5}{4}x+25$

(C) $y=\frac{4}{5}x+20$ (D) $y=\frac{4}{5}x-20$

SOLUTION

Equation of straight line: $y=mx+c$



Method 1

When $y=0,\quad x=20$

$$\therefore 0=20m+c$$

When $y=100,\quad x=100$

$$\therefore 100=100m+c$$

Subtract equations

$$\therefore 100=80m$$

$$\therefore m=\frac{5}{4}$$

If $m=\frac{5}{4}$, then $0=20\times\frac{5}{4}+c$

$$\therefore c=-25$$

i.e., $y=\frac{5}{4}x-25$

Method 2

Gradient $m=\frac{100-0}{100-20}=\frac{5}{4}$

$$\therefore y-0=\frac{5}{4}(x-20)$$

i.e., $y=\frac{5}{4}x-25$

So, the correct answer is A.