Solve $\log_3(x-2)=15-\log_2(x)$ Assuming these are the correct bases.

1) Convert the logs with different bases to all natural logs as shown.

$$\frac{\ln(x-2)}{\ln(3)}=15-\frac{\ln(x)}{\ln(2)}$$ Rewrite each log using the conversion formula

2) Now you can graph the left side and right sides, and see whether they meet. This is an approximate answer.

3) On your calculator, define $y_1=\dfrac{\ln(x-2)}{\ln(3)}$

4) On your calculator, define $y_2=15-\dfrac{\ln(x)}{\ln(2)}$

5) Carefully going through the graph using a trace feature shows $x\approx 587.771$