

**Zadatak 11.** Riješi jednađžbe:

- 1)  $2^{x-1} + 2^{x-4} + 2^{x-2} = 6.5 + 3.25 + 1.625 + \dots$ ;  
 2)  $\log_2(x - 0.666\dots) - \log_2(x - 0.8333\dots)$   
 $+ \log_2 5 = \log_2 15$ .

*Rješenje.*

1)

$$2^{x-1} + 2^{x-4} + 2^{x-2} = 6.5 + 3.25 + 1.625 + \dots$$

$$2^{x-4}(2^3 + 1 + 2^2) = \frac{13}{2} + \frac{13}{4} + \frac{13}{8} + \dots$$

$$13 \cdot 2^{x-4} = \frac{13}{2} \cdot \frac{1}{1 - \frac{1}{2}}$$

$$13 \cdot 2^{x-4} = \frac{13}{2} \cdot 2 \implies 2^{x-4} = 1 \implies x = 4;$$

2)  $\log_2(x - 0.666\dots) - \log_2(x - 0.8333\dots) + \log_2 5 = \log_2 15$ ;

$$\log_2 \left[ x - \left( \frac{6}{10} + \frac{6}{100} + \dots \right) \right] - \log_2 \left[ x - \left( \frac{8}{10} + \frac{3}{100} + \frac{3}{1000} + \dots \right) \right] + \log_2 5 = \log_2 15$$

$$\log_2 \left[ x - \frac{\frac{6}{10}}{1 - \frac{1}{10}} \right] - \log_2 \left[ x - \left( \frac{8}{10} + \frac{\frac{3}{100}}{1 - \frac{1}{10}} \right) \right] + \log_2 5 = \log_2 15$$

$$\log_2 \left( x - \frac{2}{3} \right) - \log_2 \left( x - \frac{5}{6} \right) + \log_2 5 = \log_2 15$$

$$\log_2 \left[ \left( x - \frac{2}{3} \right) : \left( x - \frac{5}{6} \right) \cdot 5 \right] = \log_2 15$$

$$5 \cdot \frac{\frac{3x-2}{6x-5}}{6} = 15$$

$$\frac{6x-4}{6x-5} = 3$$

$$6x - 4 = 18x - 15$$

$$-12x = -11$$

$$x = \frac{11}{12}$$