

LUYỆN THI VÀO LỚP 10 MÔN TOÁN

GIÁO VIÊN: NGUYỄN THÀNH LONG

TRỰC CĂN THỨC Ở MẪU BẰNG KỸ THUẬT NHÂN LIÊN HỢP

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Câu 1: tính giá trị biểu thức

a) $\frac{2+\sqrt{3}}{2-\sqrt{3}}$

b) $\frac{5+2\sqrt{6}}{5-2\sqrt{6}}$

c) $\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}}$

d) $\frac{\sqrt{2+\sqrt{3}} + \sqrt{2-\sqrt{3}}}{\sqrt{2+\sqrt{3}} - \sqrt{2-\sqrt{3}}} - \frac{\sqrt{2+\sqrt{3}} - \sqrt{2-\sqrt{3}}}{\sqrt{2+\sqrt{3}} + \sqrt{2-\sqrt{3}}}$

Câu 2: tính giá trị biểu thức

a) $A = \left(\frac{3}{2-3\sqrt{2}} + \frac{1}{\sqrt{2}+3} \right) \cdot \frac{(-7)}{\sqrt{2}}$

b) $B = \frac{2\sqrt{3}-9}{6-4\sqrt{3}} - \frac{\sqrt{3}+3}{\sqrt{3}-2} - \frac{2\sqrt{3}+1}{3-\sqrt{3}}$

c) $C = 3 + \frac{1}{\sqrt{5}-2} + \frac{2}{\sqrt{5}+2}$

Giải

Câu 1: tính giá trị biểu thức

a) $\frac{2+\sqrt{3}}{2-\sqrt{3}} = \frac{(2+\sqrt{3})(2+\sqrt{3})}{(2-\sqrt{3})(2+\sqrt{3})} = \frac{(2+\sqrt{3})^2}{2^2 - (\sqrt{3})^2} = \frac{4+4\sqrt{3}+3}{1} = 7+4\sqrt{3}$

b) $\frac{5+2\sqrt{6}}{5-2\sqrt{6}} = \frac{(5+2\sqrt{6})(5+2\sqrt{6})}{(5-2\sqrt{6})(5+2\sqrt{6})} = \frac{(5+2\sqrt{6})^2}{5^2 - (2\sqrt{6})^2} = \frac{25+20\sqrt{6}+24}{25-24} = 49+20\sqrt{6}$

c) $\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}} = \frac{(2+\sqrt{3})(2+\sqrt{3})}{(2-\sqrt{3})(2+\sqrt{3})} + \frac{(2-\sqrt{3})(2-\sqrt{3})}{(2+\sqrt{3})(2-\sqrt{3})} = \frac{(2+\sqrt{3})^2 + (2-\sqrt{3})^2}{(2+\sqrt{3})(2-\sqrt{3})} = \frac{10}{1} = 10$

$$\frac{\sqrt{2+\sqrt{3}}+\sqrt{2-\sqrt{3}}}{\sqrt{2+\sqrt{3}}-\sqrt{2-\sqrt{3}}}-\frac{\sqrt{2+\sqrt{3}}-\sqrt{2-\sqrt{3}}}{\sqrt{2+\sqrt{3}}+\sqrt{2-\sqrt{3}}}=\frac{\left(\sqrt{2+\sqrt{3}}+\sqrt{2-\sqrt{3}}\right)^2-\left(\sqrt{2+\sqrt{3}}-\sqrt{2-\sqrt{3}}\right)^2}{\left(\sqrt{2+\sqrt{3}}-\sqrt{2-\sqrt{3}}\right)\left(\sqrt{2+\sqrt{3}}+\sqrt{2-\sqrt{3}}\right)}$$

$$=\frac{2\left(\sqrt{2+\sqrt{3}}\right)^2+2\left(\sqrt{2-\sqrt{3}}\right)^2}{\left(\sqrt{2+\sqrt{3}}\right)^2-\left(\sqrt{2-\sqrt{3}}\right)^2}=\frac{8}{2\sqrt{3}}=\frac{4\sqrt{3}}{3}$$

Câu 2: tính giá trị biểu thức

$$\text{a) } A=\left(\frac{3}{2-3\sqrt{2}}+\frac{1}{\sqrt{2}+3}\right)\cdot\frac{(-7)}{\sqrt{2}}=\left(\frac{3(2+3\sqrt{2})}{(2-3\sqrt{2})(2+3\sqrt{2})}+\frac{3-\sqrt{2}}{(3+\sqrt{2})(3-\sqrt{2})}\right)\cdot\frac{(-7)}{\sqrt{2}}$$

$$=\left(\frac{6-9\sqrt{2}}{-14}+\frac{3-\sqrt{2}}{7}\right)\cdot\frac{(-7\sqrt{2})}{2}=\frac{9\sqrt{2}-6+6-2\sqrt{2}}{14}\cdot\frac{(-7\sqrt{2})}{2}=\frac{7\sqrt{2}}{14}\cdot\frac{(-7\sqrt{2})}{2}=\frac{-7}{2}$$

$$\text{b) } B=\frac{2\sqrt{3}-9}{2-\sqrt{3}}-\frac{\sqrt{3}+3}{\sqrt{3}-2}-\frac{2\sqrt{3}+1}{2-\sqrt{3}}=\frac{2\sqrt{3}-9-2\sqrt{3}+1}{2-\sqrt{3}}-\frac{\sqrt{3}+3}{\sqrt{3}-2}$$

$$=\frac{-8}{2-\sqrt{3}}+\frac{\sqrt{3}+3}{2-\sqrt{3}}=\frac{\sqrt{3}-5}{(2-\sqrt{3})(2+\sqrt{3})}=\frac{\sqrt{3}-5}{1}=\sqrt{3}-5$$

$$\text{c) } C=3+\frac{1}{\sqrt{5}-2}+\frac{2}{\sqrt{5}+2}=3+\frac{\sqrt{5}+2+2\sqrt{5}-4}{5-4}=3+3\sqrt{5}-2=1+3\sqrt{5}$$