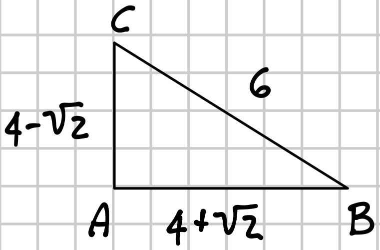
28/10/2020

528 Determina il perimetro e l'area di un triangolo rettangolo i cui cateti sono lunghi $(4-\sqrt{2})$ cm e $(4+\sqrt{2})$ cm.

[Perimetro = 14 cm, Area = 7 cm^2]



$\overline{AB} = 4+\sqrt{2}$

$\overline{AC} = 4-\sqrt{2}$

$$\boxed{\begin{array}{l} AB = (4+\sqrt{2})\text{ cm} \\ AC = (4-\sqrt{2})\text{ cm} \end{array}}$$

$$\overline{CB} = \sqrt{(4+\sqrt{2})^2+(4-\sqrt{2})^2} =$$

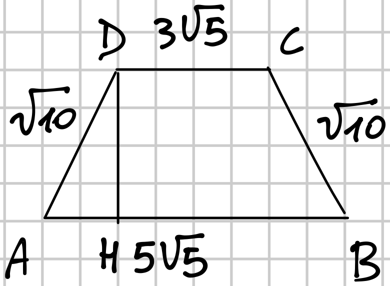
$$= \sqrt{16+2+\cancel{8\sqrt{2}}+16+2-\cancel{8\sqrt{2}}} = \sqrt{36} = 6$$

$$2p_{ABC} = 4+\cancel{\sqrt{2}}+4-\cancel{\sqrt{2}}+6 = 14 \Rightarrow 2p_{ABC} = 14\text{ cm}$$

$$\mathcal{A}_{ABC} = \frac{1}{2}\overline{AB}\cdot\overline{AC} = \frac{1}{2}\underbrace{(4+\sqrt{2})(4-\sqrt{2})}_{(A+B)(A-B)} = \frac{1}{2}\underbrace{(16-2)}_{A^2-B^2} = \frac{1}{2}\cdot 14 = 7$$

$$\mathcal{A}_{ABC} = 7\text{ cm}^2$$

529 In un trapezio isoscele le basi sono lunghe $5\sqrt{5}$ cm e $\sqrt{45}$ cm; i lati obliqui sono lunghi ciascuno $\sqrt{10}$ cm. Verifica che il perimetro del trapezio è $(8\sqrt{5}+2\sqrt{10})$ cm e l'area è 20 cm^2.



$$\overline{DC} = \sqrt{45} = \sqrt{3^2 \cdot 5} = 3\sqrt{5}$$

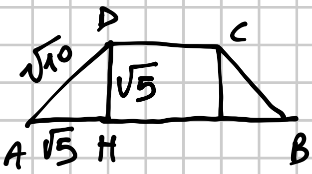
$$2p = 5\sqrt{5} + 3\sqrt{5} + 2\sqrt{10} = 8\sqrt{5} + 2\sqrt{10} \Rightarrow 2p = (8\sqrt{5} + 2\sqrt{10})\ \text{cm}$$

$$\mathcal{A} = \frac{(\overline{AB} + \overline{DC}) \cdot \overline{DH}}{2}$$

$$\overline{AH} = \frac{\overline{AB} - \overline{DC}}{2} = \frac{5\sqrt{5} - 3\sqrt{5}}{2} = \frac{\cancel{2}\sqrt{5}}{\cancel{2}} = \sqrt{5}$$

$$\overline{DH} = \sqrt{\overline{AD}^2 - \overline{AH}^2} = \sqrt{(\sqrt{10})^2 - (\sqrt{5})^2} = \sqrt{10-5} = \sqrt{5}$$

in realtà



$$\overline{AD} = \sqrt{5} \cdot \sqrt{2} = \sqrt{10}$$

perché AHD è isoscele

NON SERVE

$$\mathcal{A}_{ABCD} = \frac{(5\sqrt{5} + 3\sqrt{5}) \cdot \sqrt{5}}{2} =$$

$$= \frac{\overset{4}{\cancel{8}}\sqrt{5} \cdot \sqrt{5}}{\cancel{2}} = 4 \cdot 5 = 20 \qquad \mathcal{A}_{ABCD} = 20\ \text{cm}^2$$

614 $\dfrac{2}{(\sqrt{2}-1)(\sqrt{3}+\sqrt{5})}$ $[\sqrt{10}+\sqrt{5}-\sqrt{6}-\sqrt{3}]$

615 $\dfrac{1}{(2\sqrt{3}-\sqrt{11})(2+\sqrt{3})}$ $[2\sqrt{11}-\sqrt{33}+4\sqrt{3}-6]$

614

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

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

$$=\frac{\sqrt{6}+\sqrt{3}-\sqrt{10}-\sqrt{5}}{-(2-1)}=\frac{\sqrt{6}+\sqrt{3}-\sqrt{10}-\sqrt{5}}{-1}=$$

$$=\boxed{\sqrt{10}+\sqrt{5}-\sqrt{6}-\sqrt{3}}$$

615

$$\frac{1}{(2\sqrt{3}-\sqrt{11})(2+\sqrt{3})}\cdot\frac{2\sqrt{3}+\sqrt{11}}{2\sqrt{3}+\sqrt{11}}=$$

$$=\frac{2\sqrt{3}+\sqrt{11}}{(12-11)(2+\sqrt{3})}=\frac{2\sqrt{3}+\sqrt{11}}{2+\sqrt{3}}\cdot\frac{2-\sqrt{3}}{2-\sqrt{3}}=$$

$$=\frac{4\sqrt{3}-6+2\sqrt{11}-\sqrt{33}}{4-3}=\boxed{4\sqrt{3}-6+2\sqrt{11}-\sqrt{33}}$$

654 $\sqrt{3}\,(x+1)=\sqrt{6}$ $[\sqrt{2}-1]$

$$\sqrt{3}\,x+\sqrt{3}=\sqrt{6}$$

$$\sqrt{3}\,x=\sqrt{6}-\sqrt{3}$$

$$x=\frac{\sqrt{6}-\sqrt{3}}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}=\frac{\sqrt{18}-3}{3}=\frac{3\sqrt{2}-3}{3}=$$

$$=\frac{\cancel{3}(\sqrt{2}-1)}{\cancel{3}}=\sqrt{2}-1$$

661 $2(x-\sqrt{2})=-\sqrt{2}\,(x\sqrt{8}-\sqrt{18})$

$$2x-2\sqrt{2}=-4x+6$$

$$2x+4x=2\sqrt{2}+6$$

$$6x=2\sqrt{2}+6$$

$\frac{\sqrt{2}}{3}+\frac{3}{3}$
LIBRO

$$x=\frac{2\sqrt{2}+6}{6}=\frac{\cancel{2}(\sqrt{2}+3)}{\cancel{6}\,3}=\frac{\sqrt{2}+3}{3}$$

672 $\dfrac{x-1}{\sqrt{2}-1}=\dfrac{x+1}{\sqrt{2}+1}$

$$\frac{(x-1)(\sqrt{2}+1)}{\cancel{(\sqrt{2}-1)(\sqrt{2}+1)}}=\frac{(x+1)(\sqrt{2}-1)}{\cancel{(\sqrt{2}-1)(\sqrt{2}+1)}}$$

$$\cancel{\sqrt{2}x}+x-\sqrt{2}\cancel{-1}=\cancel{\sqrt{2}x}-x+\sqrt{2}\cancel{-1}$$

$$x+x=\sqrt{2}+\sqrt{2}$$

$$\frac{\cancel{2}x}{\cancel{2}}=\frac{\cancel{2}\sqrt{2}}{\cancel{2}} \qquad x=\sqrt{2}$$

662 $\sqrt{2}(x-1)-2(x-\sqrt{2})=2\sqrt{2}$ $[-1-\sqrt{2}]$

$$\sqrt{2}x-\sqrt{2}-2x+\cancel{2\sqrt{2}}=\cancel{2\sqrt{2}}$$

$$\sqrt{2}x-2x=\sqrt{2}$$

$$(\sqrt{2}-2)x=\sqrt{2}$$

$$\frac{\cancel{(\sqrt{2}-2)}x}{\cancel{\sqrt{2}-2}}=\frac{\sqrt{2}}{\sqrt{2}-2}\cdot\frac{\sqrt{2}+2}{\sqrt{2}+2}=\frac{2+2\sqrt{2}}{2-4}=$$

$$=\frac{\cancel{2}(1+\sqrt{2})}{-\cancel{2}}=\boxed{-1-\sqrt{2}}$$