$$\left\{\left[\frac{9}{4}+\frac{1}{2}-\left(\frac{5}{4}-1\right)-2\right]\cdot\left(-\frac{2}{3}\right)+\frac{5}{12}\right\}\cdot\left(-\frac{6}{5}\right)-\frac{1}{10}=$$

$$=\left\{\left[\frac{9}{4}+\frac{1}{2}-\left(\frac{5-4}{4}\right)-2\right]\cdot\left(-\frac{2}{3}\right)+\frac{5}{12}\right\}\cdot\left(-\frac{6}{5}\right)-\frac{1}{10}=$$

$$=\left\{\left[\frac{9}{4}+\frac{1}{2}-\frac{1}{4}-2\right]\cdot\left(-\frac{2}{3}\right)+\frac{5}{12}\right\}\cdot\left(-\frac{6}{5}\right)-\frac{1}{10}=$$

$$=\left\{\left[\frac{9+2-1-8}{4}\right]\cdot\left(-\frac{2}{3}\right)+\frac{5}{12}\right\}\cdot\left(-\frac{6}{5}\right)-\frac{1}{10}=$$

$$=\left\{\frac{\cancel{2}^{1}}{\cancel{4}_{\cancel{2}\,1}}\cdot\left(-\frac{\cancel{2}^{1}}{3}\right)+\frac{5}{12}\right\}\cdot\left(-\frac{6}{5}\right)-\frac{1}{10}=$$

$$=\left\{-\frac{1}{3}+\frac{5}{12}\right\}\cdot\left(-\frac{6}{5}\right)-\frac{1}{10}=$$

$$=\left\{\frac{-4+5}{12}\right\}\cdot\left(-\frac{6}{5}\right)-\frac{1}{10}=$$

$$=\frac{1}{\cancel{12}_{2}}\cdot\left(-\frac{\cancel{6}^{1}}{5}\right)-\frac{1}{10}=$$

$$=-\frac{1}{10}-\frac{1}{10}=-\frac{\cancel{2}^{1}}{\cancel{10}_{5}}=-\frac{1}{5}$$

$$\left\{3-\left[\left(3-\frac{1}{2}\right)\cdot\left(\frac{3}{4}-\frac{1}{2}\right)+\left(2+\frac{1}{2}\right):2\right]\right\}:\left[\left(\frac{7}{3}-2\right):\frac{4}{9}\right]=$$

$$=\left\{3-\left[\left(\frac{6-1}{2}\right)\cdot\left(\frac{3-2}{4}\right)+\left(\frac{4+1}{2}\right)\cdot\frac{1}{2}\right]\right\}:\left[\left(\frac{7-6}{3}\right)\cdot\frac{9}{4}\right]=$$

$$=\left\{3-\left[\frac{5}{2}\cdot\frac{1}{4}+\frac{5}{2}\cdot\frac{1}{2}\right]\right\}:\left[\frac{1}{\cancel{3}_{1}}\cdot\frac{\cancel{9}^{3}}{4}\right]=$$

$$=\left\{3-\left[\frac{5}{8}+\frac{5}{4}\right]\right\}:\left[\frac{3}{4}\right]=$$

$$=\left\{3-\left[\frac{5+10}{8}\right]\right\}\cdot\frac{4}{3}=$$

$$=\left\{3-\frac{15}{8}\right\}\cdot\frac{4}{3}=$$

$$=\left\{\frac{24-15}{8}\right\}\cdot\frac{4}{3}=$$

$$=\frac{\cancel{9}^{3}}{\cancel{8}_{2}}\cdot\frac{\cancel{4}^{1}}{\cancel{3}_{1}}=\frac{3}{2}$$

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4)
$$\frac{\left(-\frac{\cancel{2}^{1}}{\cancel{3}^{1}}\right)\left(-\frac{\cancel{9}^{3}}{\cancel{4}^{2}}\right)\left(+\frac{2^{5}}{3}\right)+\left\{\left(-\frac{1}{2}\right)^{20}:\left[\left(-\frac{1}{2}\right)^{9}\right]^{2}\right\}^{-1}=}{\left[\left(+\frac{1}{3}\right)^{-1}\left(+\frac{1}{3}\right)^{-6}\right]:\left(+\frac{1}{3}\right)^{-5}-5=}$$

$$=\frac{\left(\frac{\cancel{3}^{1}}{\cancel{2}^{1}}\right)\left(+\frac{\cancel{32}^{16}}{\cancel{3}^{1}}\right)+\left\{\left(-\frac{1}{2}\right)^{20}:\left[-\frac{1}{2}\right]^{18}\right\}^{-1}=}{=\left[\left(+\frac{3}{1}\right)^{1}\left(+\frac{3}{1}\right)^{6}\right]:\left(+\frac{3}{1}\right)^{5}-5=}$$

$$=\frac{\frac{16}{1}+\left\{\left(-\frac{1}{2}\right)^{2}\right\}^{-1}=}{=\left[\left(+\frac{3}{1}\right)^{7}\right]:\left(+\frac{3}{1}\right)^{5}-5=}$$

$$=\frac{\frac{16}{1}+\left\{\left(+\frac{1}{4}\right)\right\}^{-1}=}{=\left(+\frac{3}{1}\right)^{2}-5=}$$

$$=\frac{\frac{16}{1}+\left\{+\frac{4}{1}\right\}^{1}}{=\left(+\frac{9}{1}\right)-5=}=\frac{\frac{20}{1}}{\frac{4}{1}}=\frac{\cancel{20}^{5}}{1}\cdot\frac{1}{\cancel{4}_{1}}=\frac{5}{1}=5$$

$$\left[\left(0{,}6-\frac{5}{3}\right)\left(-\frac{1}{2}\right)-\frac{1}{3}-\left(-\frac{1}{3}-0{,}2\right)\right]\cdot 0{,}\overline{27}-1{,}2=$$

$$=\left[\left(\frac{\cancel{6}^{3}}{\cancel{10}_{5}}-\frac{5}{3}\right)\left(-\frac{1}{2}\right)-\frac{1}{3}-\left(-\frac{1}{3}-\frac{\cancel{2}^{1}}{\cancel{10}_{5}}\right)\right]\cdot\frac{\cancel{27}^{3}}{\cancel{99}_{11}}-\frac{\cancel{12}^{6}}{\cancel{10}_{5}}=$$

$$=\left[\left(\frac{9-25}{15}\right)\left(-\frac{1}{2}\right)-\frac{1}{3}-\left(\frac{-5-3}{15}\right)\right]\cdot\frac{3}{11}-\frac{6}{5}=$$

$$=\left[-\frac{\cancel{16}^{8}}{15}\left(-\frac{1}{\cancel{2}_{1}}\right)-\frac{1}{3}-\left(-\frac{8}{15}\right)\right]\cdot\frac{3}{11}-\frac{6}{5}=$$

$$=\left[+\frac{8}{15}-\frac{1}{3}+\frac{8}{15}\right]\cdot\frac{3}{11}-\frac{6}{5}=$$

$$=\left[\frac{+8-5+8}{15}\right]\cdot\frac{3}{11}-\frac{6}{5}=$$

$$=+\frac{\cancel{11}^{1}}{\cancel{15}_{5}}\cdot\frac{\cancel{3}^{1}}{\cancel{11}_{1}}-\frac{6}{5}=$$

$$=+\frac{1}{5}-\frac{6}{5}=-\frac{\cancel{5}^{1}}{\cancel{5}_{1}}=-1$$

$$\left(\frac{1}{2}-\frac{1}{3}\right)^{-1}-\left(1-\frac{1}{4}\right)+\left(-\frac{1}{2}\right)^{2}+2^{-1}+\left[\left(-\frac{3}{2}\right)\left(-\frac{2}{3}\right)^{2}\right]^{-1}=$$

$$=\left(\frac{3-2}{6}\right)^{-1}-\left(\frac{4-1}{4}\right)+\left(+\frac{1}{4}\right)+\frac{1}{2}+\left[\left(-\frac{3}{2}\right)\left(-\frac{3}{2}\right)^{-2}\right]^{-1}=$$

$$=\left(\frac{1}{6}\right)^{-1}-\left(\frac{3}{4}\right)+\frac{1}{4}+\frac{1}{2}+\left[\left(-\frac{3}{2}\right)^{-1}\right]^{-1}=$$

$$=6-\frac{3}{4}+\frac{1}{4}+\frac{1}{2}+\left[-\frac{3}{2}\right]^{1}=$$

$$=6-\frac{3}{4}+\frac{1}{4}+\frac{1}{2}\mp\frac{3}{2}=$$

$$=\frac{24-3+1+2\mp 6}{4}=\frac{\cancel{30}^{15}}{\cancel{4}_{2}}=\cancel{\frac{15}{2}}=+\frac{18}{4}=+\frac{9}{2}$$

$$\frac{\left(\frac{2}{3}-1\right)^4\cdot\left(-\frac{1}{3}\right)^5\cdot\left(\frac{1}{3}\right)^{-6}}{\left(\frac{2}{3}\right)^7:\left(\frac{2}{3}\right)^4}+\left(-\frac{1}{2}\right)^3-\left(-\frac{1}{2}\right)^2-\left(-\frac{2}{3}\right)^{-11}:\left[\left(-\frac{2}{3}\right)^{-5}\right]^2=$$

$$=\frac{\left(\frac{2-3}{3}\right)^4\cdot\left(-\frac{1}{3}\right)^5\cdot\left(\frac{1}{3}\right)^{-6}}{\left(\frac{2}{3}\right)^3}+\left(-\frac{1}{8}\right)-\left(+\frac{1}{4}\right)-\left(-\frac{2}{3}\right)^{-11}:\left[-\frac{2}{3}\right]^{-10}=$$

$$=\frac{\left(-\frac{1}{3}\right)^4\cdot\left(-\frac{1}{3}\right)^5\cdot\left(-\frac{1}{3}\right)^{-6}}{\left(\frac{2}{3}\right)^3}\cancel{+}-\frac{1}{8}-\frac{1}{4}-\left(-\frac{2}{3}\right)^{-1}=$$

$$=\frac{\left(-\frac{1}{3}\right)^3}{\left(\frac{2}{3}\right)^3}-\frac{1}{8}-\frac{1}{4}-\left(-\frac{3}{2}\right)=$$

$$=\left(-\frac{1}{3}\right)^3:\left(\frac{2}{3}\right)^3-\frac{1}{8}-\frac{1}{4}+\frac{3}{2}=$$

$$=\left(-\frac{1}{\cancel{3}_1}\right)^3\cdot\left(\frac{\cancel{3}^1}{2}\right)^3-\frac{1}{8}-\frac{1}{4}+\frac{3}{2}=$$

$$=\left(-\frac{1}{2}\right)^3-\frac{1}{8}-\frac{1}{4}+\frac{3}{2}=$$

$$=-\frac{1}{8}-\frac{1}{8}-\frac{1}{4}+\frac{3}{2}=$$

$$=\frac{-1-1-2+12}{8}=\frac{\cancel{8}^1}{\cancel{8}_1}=1$$

AUGUSTO
MAURIELLO

IAIL

13/12/2014

$$\left\{\left(-\frac{1}{2}\right)^{10}+\left[\left(-\frac{1}{2}\right)^{4}\right]^{2}+\left(\frac{1}{2}\right)^{7}\right\}:\left(-\frac{1}{2}\right)^{9}=$$

$$=\left\{\left(-\frac{1}{2}\right)^{10}+\left[-\frac{1}{2}\right]^{8}+\left(\frac{1}{2}\right)^{7}\right\}:\left(-\frac{1}{2}\right)^{9}=$$

$$=\left(-\frac{1}{2}\right)^{10}:\left(-\frac{1}{2}\right)^{9}+\left[-\frac{1}{2}\right]^{8}:\left(-\frac{1}{2}\right)^{9}+\left[-\left(-\frac{1}{2}\right)^{7}:\left(-\frac{1}{2}\right)^{9}\right]=$$

$$=\left(-\frac{1}{2}\right)+\left[-\frac{1}{2}\right]^{-1}+\left[-\left(-\frac{1}{2}\right)^{-2}\right]=$$

$$=-\frac{1}{2}+\left[-2\right]+\left[-\left(-2\right)^{2}\right]=$$

$$=-\frac{1}{2}-2+\left[-\left(+4\right)\right]=$$

$$=-\frac{1}{2}-2+\left[-4\right]=$$

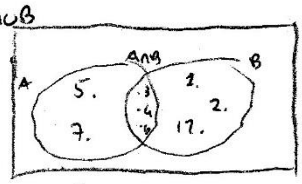
$$=-\frac{1}{2}-2-4=$$

$$=\frac{-1-4-8}{2}=-\frac{13}{2}$$

INSIEMI

$A=\{3,4,5,6,7\}$

$B=\{1,2,3,4,6,12\}$

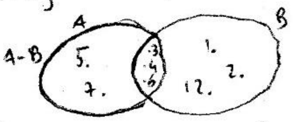


OK

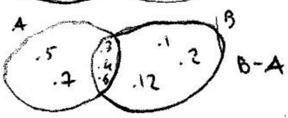
$A\cap B=\{3,4,5,6,7\}\cap\{1,2,3,4,6,12\}=\{3,4,6\}$

$A\cup B=\{3,4,5,6,7\}\cup\{1,2,3,4,6,12\}=\{1,2,3,4,5,6,7,12\}$

$A-B=\{3,4,5,6,7\}-\{1,2,3,4,6,12\}=\{5,7\}$

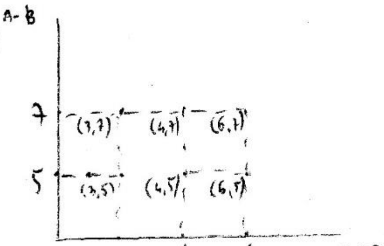


$B-A=\{1,2,3,4,6,12\}-\{3,4,5,6,7\}=\{1,2,12\}$

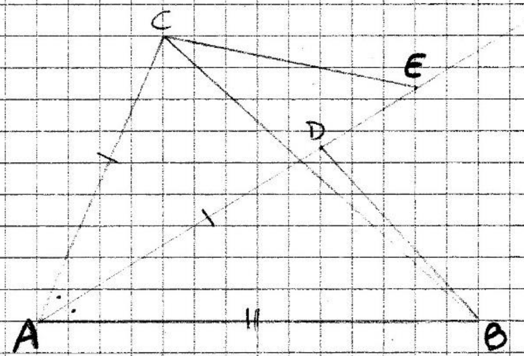


$(A\cap B)\times(A-B)=\{3,4,6\}\times\{5,7\}=$

$=\{(3,5);(3,7);(4,5);(4,7);(6,5);(6,7)\}$



8.



Hp:

$AC < AB$

$C\hat{A}D \cong D\hat{A}B$

$AD \cong AC$

$AE \cong AB$

Th:

$CE \cong BD$

Dimostrazione

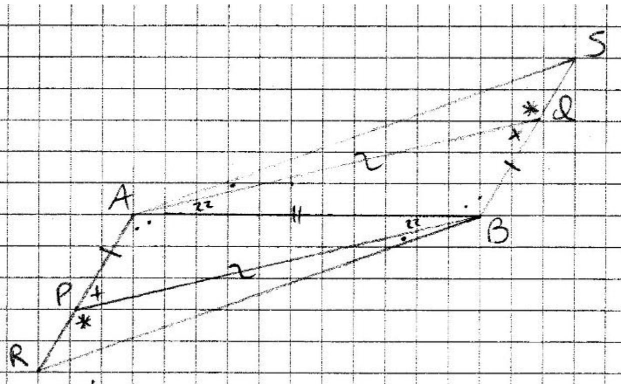
Considero i triangoli $A\overset{\triangle}{C}E$ e $A\overset{\triangle}{D}B$. Essi hanno:

1. $C\hat{A}D \cong D\hat{A}B$ per HP
2. $AE \cong AB$ per HP
3. $AD \cong AC$ per HP

Dunque i due triangoli avendo due lati e l'angolo tra essi compreso ordinatamente congruenti sono congruenti per il I criterio di congruenza. In particolare ad angoli congruenti si oppongono lati congruenti cioè:

$CE \cong BD$

9.



Hp:

$P\hat{A}B \cong A\hat{B}Q$ $\quad AP \cong BQ$

$P\hat{B}R \cong Q\hat{A}S$

Th:

$AS \cong BR$

Dimostrazione

Considero i triangoli $A\overset{\triangle}{B}P$ e $A\overset{\triangle}{B}Q$. Essi hanno:

1. AB in comune
2. $AP \cong BQ$ per HP
3. $P\hat{A}B \cong A\hat{B}Q$ per HP

Dunque i due triangoli avendo due lati e l'angolo tra essi compreso ordinatamente congruenti sono congruenti per il I criterio di congruenza (LAL). In particocare ad elementi congruenti si oppongono elementi congruenti cioè:

a. $PB \cong AQ$ $\quad$ b. $A\hat{P}B \cong A\hat{Q}B$ $\quad$ c. $A\hat{B}P \cong B\hat{A}Q$

Considero i triangoli $P\overset{\triangle}{R}B$ e $A\overset{\triangle}{S}Q$. Essi hanno:

1. $PB \cong AQ$ per precedente dimostrazione
2. $P\hat{B}R \cong Q\hat{A}S$ per HP
3. $B\hat{P}R \cong A\hat{Q}S$ perché supplementare di angoli congruenti

Dunque i due triangoli avendo un lato e i due angoli ad esso adiacenti ordinatamente congruenti sono congruenti per il II criterio di congruenza (ALA). In particolare ad angoli congruenti si oppongono lati congruenti cioè:

$AS \cong BR$