

Massimo Comune Divisore (M.C.D.) e del minimo comune multiplo (m.c.m.).
Diversi metodi a confronto. Livello base. Completi di soluzione guidata.
Highest Common Factor (Greatest Common Factor) and Lowest Common Multiple (Least Common Multiple)

Calcola il M.C.D. e il m.c.m. di ciascun gruppo di numeri. Utilizzando anche il metodo insiemistico e, per il M.C.D., l'algoritmo di Euclide.

1. M.C.D.(10, 15) e m.c.m.(10, 15) [soluzione](#)
2. M.C.D.(10, 30) e m.c.m.(10, 30) [soluzione](#)
3. M.C.D.(14, 35) e m.c.m.(14, 35) [soluzione](#)
4. M.C.D.(15, 45) e m.c.m.(15, 45) [soluzione](#)
5. M.C.D.(26, 39) e m.c.m.(26, 39) [soluzione](#)
6. M.C.D.(48, 36) e m.c.m.(48, 36) [soluzione](#)
7. M.C.D.(49, 70) e m.c.m.(49, 70) [soluzione](#)
8. M.C.D.(6, 35) e m.c.m.(6, 35) [soluzione](#)
9. M.C.D.(144, 168) e m.c.m.(144, 168) [soluzione](#)
10. M.C.D. (66, 88) e m.c.m. (66, 88) [soluzione](#)

Calcola il M.C.D. e il m.c.m. di ciascun gruppo di numeri.

11. M.C.D.(12, 21, 14) e m.c.m.(12, 21, 14) [soluzione](#)
12. M.C.D.(15, 40, 25) e m.c.m.(15, 40, 25) [soluzione](#)
13. M.C.D.(12, 21, 42) e m.c.m.(12, 21, 42) [soluzione](#)
14. M.C.D.(18, 10, 15) e m.c.m.(18, 10, 15) [soluzione](#)

Soluzioni

m. c. m. (10, 15)

$$10 = 2 \cdot 5$$

$$15 = 3 \cdot 5$$

Fattorizzazione

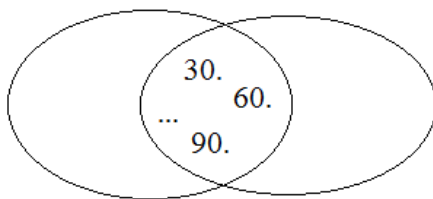
$$m. c. m. (10, 15) = 2 \cdot 3 \cdot 5 = 30$$

$$M_{10} = \{10, 20, 30, 40, 50, 60, 70, 80, 90, \dots\}$$

$$M_{15} = \{15, 30, 45, 60, 75, 90, 105, \dots\}$$

Ricerca dei multipli comuni

$$M_{10} \cap M_{15} = \{30, 60, 90, \dots\}$$



M. C. D. (10, 15)

$$10 = 2 \cdot 5$$

$$15 = 3 \cdot 5$$

Fattorizzazione

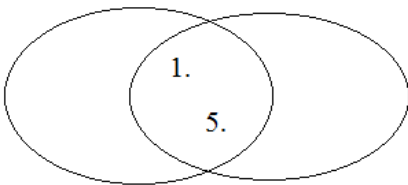
$$MCD (10, 15) = 5$$

$$D_{10} = \{1, 2, 5, 10\}$$

$$D_{15} = \{1, 3, 5, 15\}$$

Ricerca dei divisori comuni

$$D_{10} \cap D_{15} = \{1, 5\}$$



Metodo di Euclide

$$15 - 10 = 5$$

$$10 - 5 = 5 \gg \text{M.C.D.}$$

$$5 - 5 = 0$$

$$m. c. m. (a, b) = \frac{a \cdot b}{M. C. D. (a, b)} \rightarrow m. c. m. (10, 15) = \frac{2 \cdot 5 \cdot 3 \cdot 5}{5} = 30$$

M.C.D. (10, 30)

$$10 = 2 \cdot 5$$

$$30 = 2 \cdot 3 \cdot 5$$

Fattorizzazione

$$M.C.D. (10, 30) = 2 \cdot 5 = 10$$

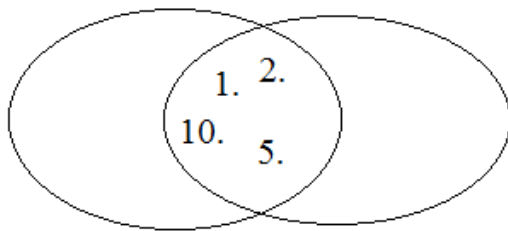
$$D_{10} = \{1, 2, 5, 10\}$$

$$D_{30} = \{1, 2, 3, 5, 6, 10, 15, 30\}$$

Ricerca dei divisori comuni

$$D_{10} \cap D_{30} = \{1, 2, 5, 10\}$$

$$M.C.D. (10, 30) = 10$$

**Metodo di Euclide**

$$30 - 10 = 20$$

$$20 - 10 = 10 \gg M.C.D.$$

$$10 - 10 = 0$$

m. c. m. (10, 30)

$$10 = 2 \cdot 5$$

$$30 = 2 \cdot 3 \cdot 5$$

Fattorizzazione

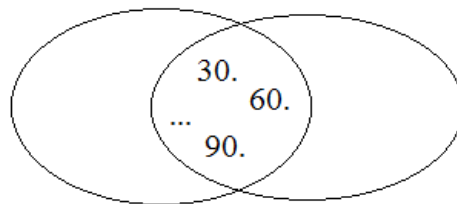
$$m. c. m. (10, 30) = 2 \cdot 3 \cdot 5$$

$$M_{10} = \{10, 20, 30, 40, 50, 60, 70, 80, 90, \dots\}$$

$$M_{30} = \{30, 60, 90, 120, 150, \dots\}$$

Ricerca dei multipli comuni

$$M_{10} \cap M_{30} = \{30, 60, 90, \dots\}$$



$$m. c. m. (a, b) = \frac{a \cdot b}{M.C.D. (a, b)} \rightarrow m. c. m. (10, 30) = \frac{2 \cdot 5 \cdot 2 \cdot 3 \cdot 5}{2 \cdot 5} = 30$$

M.C.D. (14, 35)

$$14 = 2 \cdot 7$$

$$35 = 7 \cdot 5$$

Fattorizzazione

$$MCD(14, 35) = 7$$

Ricerca dei divisori comuni

$$D_{14} = \{1, 2, 7, 14\}$$

$$D_{35} = \{1, 5, 7, 35\}$$

$$D_{14} \cap D_{35} = \{1, 7\} \rightarrow MCD(14, 35) = 7$$

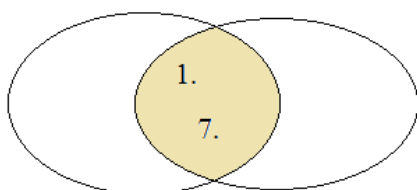
Metodo di Euclide

$$35 - 14 = 21$$

$$21 - 14 = 7$$

$$14 - 7 = 7 \gg M.C.D.$$

$$7 - 7 = 0$$

**m. c. m. (14, 35)**

$$14 = 2 \cdot 7$$

$$35 = 7 \cdot 5$$

Fattorizzazione

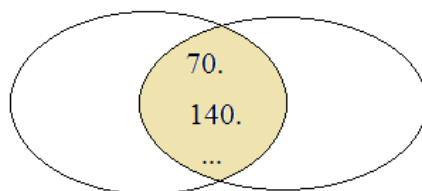
$$M.C.M.(14, 35) = 2 \cdot 5 \cdot 7 = 70$$

$$M_{14} = \{14, 28, 42, 56, 70, 84, 98, 112, 126, 140, \dots\}$$

$$M_{35} = \{35, 70, 105, 140, 175, 210, \dots\}$$

Ricerca dei multipli comuni

$$M_{14} \cap M_{35} = \{70, 140, \dots\}$$



$$m.c.m.(a, b) = \frac{a \cdot b}{M.C.D.(a, b)} \rightarrow m.c.m.(14, 35) = \frac{2 \cdot 7 \cdot 7 \cdot 5}{7} = 70$$

M.C.D. (15, 45)

$$15 = 3 \cdot 5$$

$$45 = 3^2 \cdot 5$$

Fattorizzazione

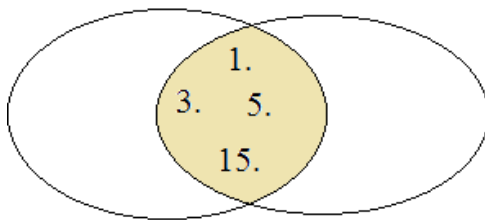
$$M.C.D.(15, 45) = 3 \cdot 5$$

$$D_{15} = \{1, 3, 5, 15\}$$

$$D_{45} = \{1, 3, 5, 9, 15, 45\}$$

$$D_{15} \cap D_{45} = \{1, 3, 5, 15\}$$

$$M.C.D.(15, 45) = 15$$



Metodo di Euclide

$$45 - 15 = 30$$

$$30 - 15 = 15 \gg M.C.D.$$

$$15 - 15 = 0$$

m. c. m. (15, 45)

$$15 = 3 \cdot 5$$

$$45 = 3^2 \cdot 5$$

Fattorizzazione

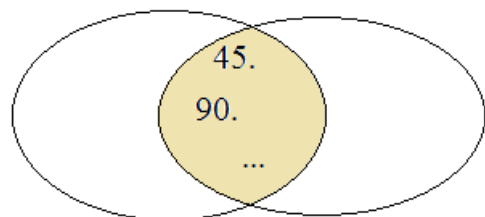
$$m. c. m.(15, 45) = 3^2 \cdot 5 = 45$$

$$M_{15} = \{15, 30, 45, 60, 75, 90, 105, \dots\}$$

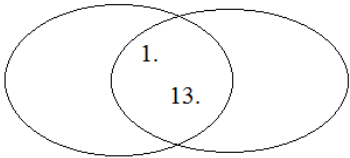
$$M_{45} = \{45, 90, 135, 180, \dots\}$$

$$M_{15} \cap M_{45} = \{45, 90, \dots\}$$

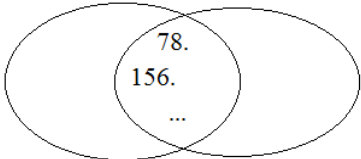
$$m. c. m.(15, 45) = 45$$



M.C.D. (26, 39)

$26 = 2 \cdot \mathbf{13}$ $39 = 3 \cdot \mathbf{13}$	Fattorizzazione $M.C.D.(26, 39) = 13$
Ricerca dei divisori comuni $D_{26} = \{1, 2, \mathbf{13}, 26\}$ $D_{39} = \{1, 3, \mathbf{13}, 39\}$	$D_{26} \cap D_{39} = \{1, \mathbf{13}\}$ $M.C.D.(26, 39) = 13$
	Metodo di Euclide $39 - 26 = 13$ $26 - 13 = \mathbf{13}$ M.C.D. $13 - 13 = 0$

m. c. m. (26, 39)

$26 = 2 \cdot 13$ $39 = 3 \cdot 13$	Fattorizzazione $m.c.m.(26, 13) = 2 \cdot 3 \cdot 13$ $= 78$
Ricerca dei multipli comuni $M_{26} = \{26, 52, \mathbf{78}, 104, 130, \mathbf{156}, 182, \dots\}$ $M_{39} = \{39, \mathbf{78}, 117, \mathbf{156}, 195, 234, 273, \dots\}$	$M_{26} \cap M_{39} = \{\mathbf{78}, 156, \dots\}$ $m.c.m.(26, 13) = 78$
	

M.C.D. (48, 36)

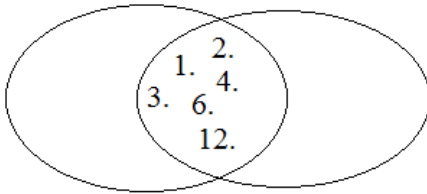
$$48 = 2^4 \cdot 3$$

$$36 = 2^2 \cdot 3^2$$

Ricerca dei divisori comuni

$$D_{48} = \{1, 2, 3, 4, 6, 8, 12, 16, 24, 48\}$$

$$D_{36} = \{1, 2, 3, 4, 6, 9, 12, 18, 36\}$$



Fattorizzazione

$$MCD(48, 36) = 2^2 \cdot 3 = 12$$

$$D_{48} \cap D_{36} = \{1, 2, 3, 4, 6, 12\}$$

$$M.C.D.(48, 36) = 12$$

Metodo di Euclide

$$48 - 36 = 12$$

$$36 - 12 = 24$$

$$24 - 12 = 12 \gg M.C.D.$$

$$12 - 12 = 0$$

m.c.m. (48, 36)

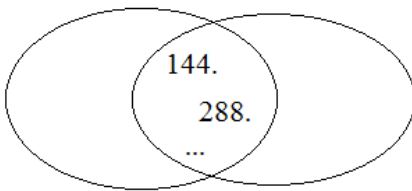
$$48 = 2^4 \cdot 3$$

$$36 = 2^2 \cdot 3^2$$

Ricerca dei multipli comuni

$$M_{48} = \{48, 96, 144, 192, 240, 288, \dots\}$$

$$M_{36} = \{36, 72, 108, 144, 180, 216, 252, 288, \dots\}$$



Fattorizzazione

$$m.c.m.(48, 36) = 2^4 \cdot 3^2 = 144$$

$$M_{48} \cap M_{36} = \{144, 288, \dots\}$$

$$mcm(48, 36) = 144$$

$MCD(49, 70)$

$mcm(49, 70)$

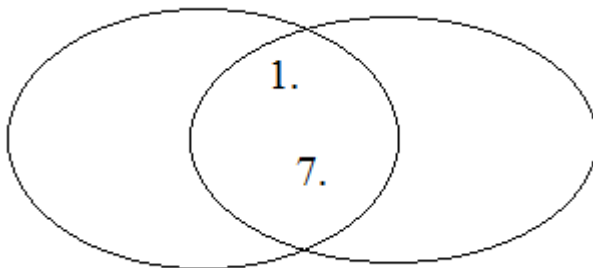
$$49 = 7^2$$

$$70 = 2 \cdot 5 \cdot 7$$

$$D_{49} = \{1, 7, 49\}$$

$$D_{70} = \{1, 2, 5, 7, 10, 14, 35, 70\}$$

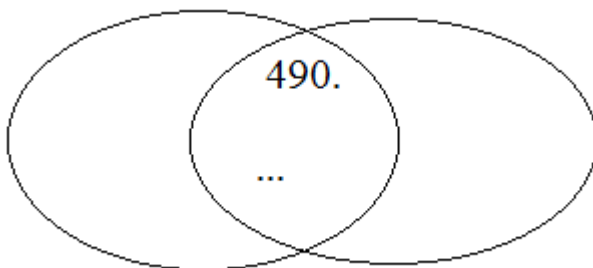
$$D_{49} \cap D_{70} = \{1, 7\}$$



$$M_{49} = \{49, 98, 147, 196, 245, 294, 343, 392, 441, 490, \dots\}$$

$$M_{70} = \{70, 140, 210, 280, 350, 420, 490, 560, \dots\}$$

$$M_{49} \cap M_{70} = \{490, \dots\}$$



Fattorizzazione

$$MCD(49, 70) = 7$$

Metodo di Euclide

$$70 - 49 = 21$$

$$49 - 21 = 28$$

$$28 - 21 = 7$$

$$21 - 7 = 14$$

$$14 - 7 = 7 \text{ M.C.D.}$$

$$7 - 7 = 0$$

$$mcm(49, 70) = 2 \cdot 5 \cdot 7$$

$$mcm(49, 70) = 490$$

M.C.D. (6, 35)

m.c.m. (6, 35)

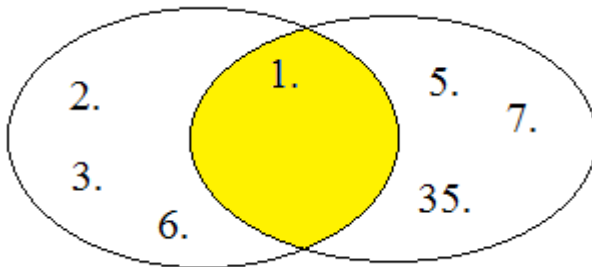
$$6 = 2 \cdot 3$$

$$35 = 7 \cdot 5$$

$$D_6 = \{1, 2, 3, 6\}$$

$$D_{35} = \{1, 5, 7, 35\}$$

$$D_6 \cap D_{35} = \{1\}$$



$$M_6 = \{6, 12, 18, 24, 30, 36, \dots, 192, 198, 204, 210, \dots\}$$

$$M_{35} = \{35, 70, 105, 140, 175, 210, 245, \dots\}$$

$$M_{15} \cap M_{45} = \{210, \dots\}$$

Fattorizzazione

M.C.D. (6, 35) = 1

Sono primi tra loro

Metodo di Euclide

$$35 - 6 = 29$$

$$29 - 6 = 23$$

$$23 - 6 = 17$$

$$17 - 6 = 11$$

$$11 - 6 = 5$$

$$6 - 5 = 1$$

$$5 - 1 = 4$$

$$4 - 1 = 3$$

$$3 - 1 = 2$$

$$2 - 1 = 1 \text{ M.C.D.}$$

$$1 - 1 = 0$$

$$mcm(6, 35) = 2 \cdot 3 \cdot 5 \cdot 7$$

$$mcm(6, 35) = 21 \cdot 10 = 210$$

M.C.D. (144, 168)

m.c.m. (144, 168)

$$144 = 2^4 \cdot 3^2$$

$$168 = 2^3 \cdot 3 \cdot 7$$

$$D_{144} = \{1, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, 144\}$$

$$D_{168} = \{1, 2, 3, 4, 6, 7, 8, 12, 14, 21, 24, 28, 56, 84, 168\}$$

$$D_{144} \cap D_{168} = \{24\}$$

$$M_{144} = \{144, 288, 432, 576, 720, 864, 1008, 1152, \dots\}$$

$$M_{168} = \{168, 336, 504, 672, 840, 1008, 1176, \dots\}$$

$$M_{144} \cap M_{168} = \{1008, \dots\}$$

Fattorizzazione

$$\mathbf{M.C.D. (144, 168) = 24}$$

Metodo di Euclide

$$168 - 144 = 24$$

$$144 - 24 = 120$$

$$120 - 24 = 96$$

$$96 - 24 = 72$$

$$72 - 24 = 48$$

$$48 - 24 = 24 \text{ M.C.D.}$$

$$24 - 24 = 0$$

$$mcm(144, 168) = 2^4 \cdot 3^2 \cdot 7$$

$$mcm(144, 168) = 16 \cdot 9 \cdot 7$$

$$= 1008$$

M.C.D. (66, 88)

m.c.m. (66, 88)

$$66 = 2 \cdot 3 \cdot 11$$

$$88 = 2^3 \cdot 11$$

Fattorizzazione

$$D_{66} = \{1, 2, 3, 6, 11, 22, 33, 66\}$$

$$D_{88} = \{1, 2, 4, 8, 11, 22, 44, 88\}$$

$$D_{66} \cap D_{88} = \{22\}$$

$$\mathbf{M.C.D. (66, 88) = 22}$$

Metodo di Euclide

$$88 - 66 = 22$$

$$66 - 22 = 44$$

$$44 - 22 = 22 \text{ M.C.D.}$$

$$22 - 22 = 0$$

$$M_{66} = \{66, 132, 198, 264, 330, \dots\}$$

$$M_{88} = \{88, 176, 264, 352, \dots\}$$

$$M_{144} \cap M_{68} = \{264, \dots\}$$

$$mcm(66, 88) = 2^3 \cdot 3 \cdot 11$$

$$mcm(144, 168) = 8 \cdot 33 \\ = 264$$

M.C.D. (12, 21, 14)

m.c.m. (12, 21, 14)

$$12 = 2^2 \cdot 3$$

$$21 = 3 \cdot 7$$

$$14 = 2 \cdot 7$$

Fattorizzazione

$$D_{12} = \{1, 2, 4, 6, 12\}$$

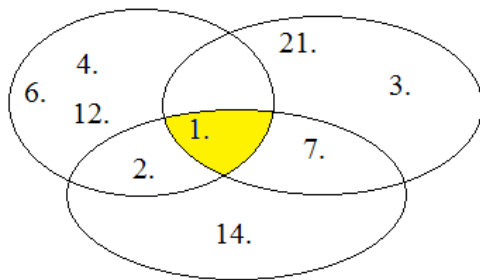
$$D_{21} = \{1, 3, 7, 21\}$$

$$D_{14} = \{1, 2, 7, 14\}$$

$$D_{12} \cap D_{21} \cap D_{14} = \{1\}$$

$$MCD(12, 21, 14) = 1$$

Sono primi tra loro (coprimi).



$$M_{12} = \{12, 24, 36, 48, 60, 72, 84, 96, 108, 120, 132, 144, 156, 168, \dots\}$$

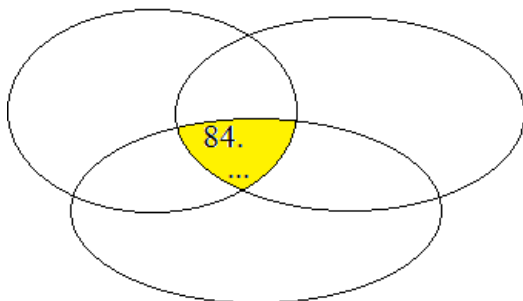
$$M_{21} = \{21, 42, 63, 84, 105, 126, 147, 168, 189, 210, \dots\}$$

$$M_{14} = \{14, 28, 42, 56, 70, 84, 98, 112, 126, 140, 154, 168, \dots\}$$

$$M_{12} \cap M_{21} \cap M_{14} = \{84, 168, \dots\}$$

$$mcm(12, 21, 14) = 2^2 \cdot 3 \cdot 7$$

$$mcm(12, 21, 14) = 84$$



M.C.D. (15, 40, 25)

m.c.m. (15, 40, 25)

$$15 = 3 \cdot 5$$

$$40 = 2^3 \cdot 5$$

$$25 = 5^2$$

Fattorizzazione

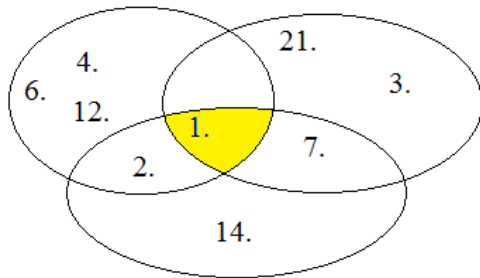
$$D_{15} = \{1, 3, 5, 15\}$$

$$D_{40} = \{1, 2, 4, 5, 8, 10, 20, 40\}$$

$$D_{25} = \{1, 5, 25\}$$

$$D_{15} \cap D_{40} \cap D_{25} = \{1, 5\}$$

$$MCD(15, 40, 25) = 5$$



$$M_{15} = \{15, 30, 45, 60, 75, 90, 105, 120, \dots, 585, 600, \dots\}$$

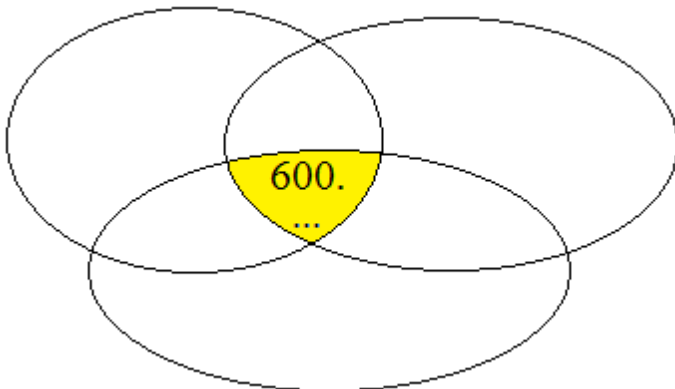
$$M_{40} = \{40, 80, 120, 160, 200, 240, 280, \dots, 560, 600, \dots\}$$

$$M_{25} = \{25, 50, 75, 100, 125, 150, 200, 250, 300, \dots, 575, 600, \dots\}$$

$$M_{15} \cap M_{40} \cap M_{25} = \{600, 1200, \dots\}$$

$$mcm(15, 40, 25) = 2^3 \cdot 3 \cdot 5^2$$

$$mcm(15, 40, 25) = 600$$



M.C.D. (12, 21, 42)

m.c.m. (12, 21, 42)

$$12 = 2^2 \cdot 3$$

$$21 = 3 \cdot 7$$

$$42 = 2 \cdot 3 \cdot 7$$

Fattorizzazione

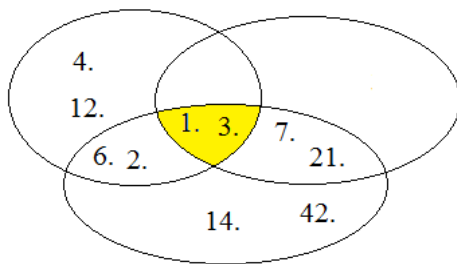
$$D_{12} = \{1, 2, 3, 4, 6, 12\}$$

$$D_{21} = \{1, 3, 7, 21\}$$

$$D_{42} = \{1, 2, 3, 6, 7, 14, 21, 42\}$$

$$D_{12} \cap D_{21} \cap D_{42} = \{1, 3\}$$

$$MCD(12, 21, 42) = 3$$



$$M_{12} = \{12, 24, 36, 48, 60, 72, 84, 96, 108, 120, 132, 144, 156, 168, \dots\}$$

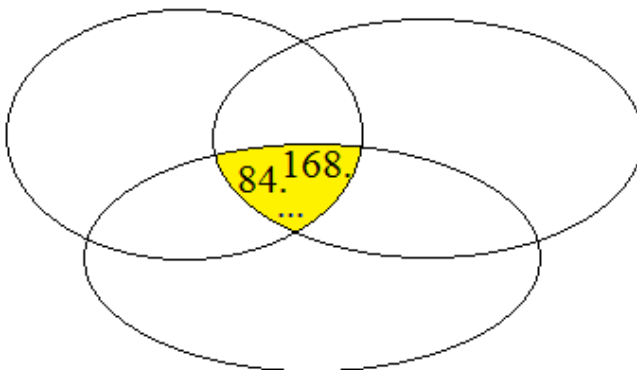
$$M_{21} = \{21, 42, 63, 84, 105, 126, 147, 168, \dots\}$$

$$M_{42} = \{42, 84, 126, 168, 210, \dots\}$$

$$M_{12} \cap M_{21} \cap M_{42} = \{84, 168, \dots\}$$

$$mcm(12, 21, 42) = 2^2 \cdot 3 \cdot 7$$

$$mcm(12, 21, 42) = 84$$



M.C.D. (18, 10, 15)

m.c.m. (18, 10, 15)

$$18 = 2 \cdot 3^2$$

$$10 = 2 \cdot 5$$

$$15 = 3 \cdot 5$$

Fattorizzazione

$$D_{18} = \{1, 2, 3, 6, 9, 18\}$$

$$D_{10} = \{1, 2, 5, 10\}$$

$$D_{15} = \{1, 3, 5, 15\}$$

$$D_{18} \cap D_{10} \cap D_{15} = \{1\}$$

$$MCD(18, 10, 15) = 1$$

Sono primi tra di loro (coprimi).

$$M_{18} = \{18, 36, 54, 72, 90, 108, 126, \dots\}$$

$$M_{10} = \{10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, \dots\}$$


$$M_{15} = \{15, 30, 45, 60, 75, 90, 105, 120, \dots\}$$


$$M_{18} \cap M_{10} \cap M_{15} = \{90, 180, \dots\}$$


$$mcm(18, 10, 15) = 2 \cdot 3^2 \cdot 5$$


$$mcm(18, 10, 15) = 90$$


Keywords

 *Matematica, Aritmetica, Divisibilità, Fattorizzazione, MCD, mcm, Massimo Comune Divisore, minimo comune multiplo, algoritmo di Euclide, esercizi con soluzioni*

 *Math, Arithmetic, Divisibility, Highest Common Factor, HCF, Greatest Common Factor, GCF, Lowest Common Multiple, LCM, Least Common Multiple, LCM, Greatest common divisor, GDC, Euclidean Algorithm*

 *Matemática, Aritmética, Máximo común divisor, mcd, m.c.d., Mínimo común múltiplo, mcm, m.c.m., algoritmo de Euclides.*

 *Mathématique, Arithmétique, Divisibilité, factorisation, Plus grand commun diviseur, PGDC, Plus petit commun multiple, PPCM, Algorithme d'Euclide*

 *Mathematik, Arithmetik, Größter gemeinsamer Teiler, kleinstes gemeinsames Vielfaches, Euklidischer Algorithmus*