### M.C.D e m.c.m. tra polinomi

Calcola il M.C.D e m.c.m tra i seguenti gruppi di polinomi.

<p>| | | |</p>
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<tbody>
<tr>
<td><strong>1</strong></td>
<td>$3x^2 - 12$;</td>
<td>$4x^2 - 16x + 16$</td>
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</table>
|   | $x^2 - 2x$ | M.C.D: $x - 2$  
   |   | m.c.m: $12x(x - 2)^2(x + 2)$ | |
| **2** | $x^4 + x^2y^2$ | $x^4 - y^4$ |
|   | $x^4 - y^4$ | M.C.D: $x^2 + y^2$  
   |   | m.c.m: $x^2(x^2 + y^2)^2(x^2 - y^2)$ | |
| **3** | $a^3 - 2a^2 + a$ | $a^4 - a^3$ |
|   | $a^4 - a^2$ | M.C.D: $a(a - 1)$  
   |   | m.c.m: $a^2(a - 1)^2(a + 1)$ | |
| **4** | $m^4 - m^3$ | $m^4 - m^2$ |
|   | $m^4 - m$ | M.C.D: $m(m - 1)$  
   |   | m.c.m: $m^3(m - 1)(m + 1)(m^2 + m + 1)$ | |
| **5** | $a^2b^2 + a^2bc$ | $ab^4 + ab^2c^2$ |
|   | $a^3b^3 + a^2b^2c + a^2b^3x + a^2b^2xc$ | M.C.D: $ab$  
   |   | m.c.m: $a^2b^2(b^2 + c^2)(b + c)(a + x)$ | |
| **6** | $m^2 + m + mn + n$ | $m^2 - m - mn - n$ |
|   | $m^2 - m + mn - n$ | M.C.D: $1$  
   |   | m.c.m: $(m^2 - n^2)(m^2 - 1)$ | |
| **7** | $x^4 - y^4$ | $x^3 - x^2y - xy^2 + y^3$ |
|   | $x^4 + y^4 - 2x^2y^2$ | M.C.D: $x^2 - y^2$  
   |   | m.c.m: $(x - y)^2(x + y)^2(x^2 + y^2)$ | |
| **8** | $m^3 - 1$ | $m^3 - m$ |
|   | $m^2 - 2m + 1$ | M.C.D: $m - 1$  
   |   | m.c.m: $m(m - 1)^2(m + 1)(m^2 + m + 1)$ | |
| **9** | $2u^5v - 2u^3v^3$ | $4u^3v^2 + 4uv^4$ |
|   | $-2u^2v^3 + 2u^4v$ | M.C.D: $2uv$  
   |   | m.c.m: $4u^3v^2(u + v)(u - v)(u^2 + v^2)$ | |
| **10** | $x^5 - 16x$ | $x^5 - 4x^3$ |
|   | $2x^3 - 8x - 4x^2 + 16$ | M.C.D: $x - 2$  
   |   | m.c.m: $2x^3(x + 2)(x - 2)(x^2 + 4)$ | |
| **11** | $m^2 - 2mn + n^2 - 4$ | $m - n + 2$ |
|   | $m^2 - mn + 2m$ | M.C.D: $m - n + 2$  
<p>|   | m.c.m: $m(m - n + 2)(m - n - 2)$ |</p>
<table>
<thead>
<tr>
<th></th>
<th>Polinomi</th>
<th>M.C.D.</th>
<th>m.c.m.</th>
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<tbody>
<tr>
<td>12</td>
<td>$2x^3 - 2xy^2$</td>
<td>$x - y$</td>
<td>$2xy(x - y)^2(x + y)$</td>
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<td>$2x^2 - 4xy + 2y^2$</td>
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<td>13</td>
<td>$3m - 6n$</td>
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<td>$6(m - 2n)(m + 2n)$</td>
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<td>$6m + 12n$</td>
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<td>$m^2 - 4n^2$</td>
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<td>14</td>
<td>$x^2 - x + xz - z$</td>
<td>$x - 1$</td>
<td>$(x - 1)(x + 1)(x + z)(y - 1)$</td>
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<td>$x^2 - 1$</td>
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<td>$xy - y - x + 1$</td>
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<td>15</td>
<td>$1 - 3a + 3a^2 - a^3$</td>
<td>$1 - a$</td>
<td>$x(1 - a)^3(x + a)$</td>
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<td>$x + a - ax - a^2$</td>
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<td>$x - ax$</td>
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<td>16</td>
<td>$(m^2 - 3m + 2)^2$</td>
<td>$m - 2$</td>
<td>$(m - 2)^2(m - 1)^2(m + 2)(m - n)$</td>
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<td>$m^3 - m^2 - 4m + 4$</td>
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<td>$m^3 - nm^2 - 4m + 4n$</td>
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<td>17</td>
<td>$(x^2 - 9)(x^2 + 4)$</td>
<td>$(x^2 + 4)$</td>
<td>$x^2(x^2 + 4)(x - 3)^2(x + 3)^2$</td>
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<td>$(x^2 - 6x + 9)(x^3 + 4x)$</td>
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<td>$(x^2 + 6x + 9)(x^4 + 4x^2)$</td>
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<td>18</td>
<td>$3a^3 - 4a^2 + 5a - 4$</td>
<td>$3a^2 - a + 4$</td>
<td>$5(3a^2 - a + 4)(a - 1)(a + 2)$</td>
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<td>$3a^3 + 5a^2 + 2a + 8$</td>
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<td>$15a^2 + 5a + 20$</td>
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<td>$3a^3 - 2a^2 + 3a - 2$</td>
<td>$3a - 2$</td>
<td>$(3a - 2)(3a + 2)(a^2 + 1)(a + 1)$</td>
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<td>$9a^2 - 4$</td>
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<td>$6u^2 + u - 2$</td>
<td>$2u - 1$</td>
<td>$u(2u - 1)(2u + 1)(3u + 2)$</td>
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<td>$2m^3 + m^2 - 18m - 9$</td>
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<td>$(m + 2)(2m + 1)(m - 3)(m + 3)$</td>
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<td>$a^2 + 3a + ab + 3b$</td>
<td>$a + b$</td>
<td>$(a + b)^2(a + 3)(a - 3)$</td>
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<td>$a^3 - 9a + a^2b - 9b$</td>
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<td>Exercise</td>
<td>Expression 1</td>
<td>Expression 2</td>
<td>M.C.D.</td>
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<td>23</td>
<td>$t^2 - 5tz$</td>
<td>$4t^2 - 100z^2$</td>
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<td>$\frac{5}{5} - 2tz + 5z^2$</td>
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<td>24</td>
<td>$2x^3 - x^2 - 7x + 6$</td>
<td>$2x^2 + 7x + 6$</td>
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<td>$2x^2 + x - 3$</td>
<td>$2\pi x^2 - 3\pi x$</td>
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<td>$4a - x^2 + a^2 + 4$</td>
<td>$5a + 10 + 5x$</td>
<td>$(a + x + 2)$</td>
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<td>$a^2 + x^2 + 4 + 4a + 2ax + 4x$</td>
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<td>27</td>
<td>$x^{2n} - y^{2n}$</td>
<td>$x^{2n} + y^{2n} - 2x^n y^n$</td>
<td>$x^n - y^n$</td>
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<td>$nx^n - ny^n$</td>
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<td>28</td>
<td>$m^3 + m^2 - m - 1$</td>
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<td>$m + \frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
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<td>29</td>
<td>$y^2 + 2y + 4$</td>
<td>$y^3 - 8$</td>
<td>$y^2 + 2y + 4$</td>
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<td>30</td>
<td>$2x^2 + 18x + 16$</td>
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<td>$2x^2 - 14x - 16$</td>
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<td>31</td>
<td>$x^4 - 9$</td>
<td>$x^4 + x^2 - 6$</td>
<td>$x^2 + 3$</td>
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<td>$x^3 + 3x$</td>
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<td>32</td>
<td>$x^3 - 4x^2 + 5x - 2$</td>
<td>$x^2 - 3x + 2$</td>
<td>$(x - 1)(x - 2)$</td>
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<td>$x^3 - 5x^2 + 8x - 4$</td>
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<tr>
<td>33</td>
<td>$x^2 - 1$</td>
<td>$x^2 + 2x + 1$</td>
<td>$x + 1$</td>
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<td>$x^3 + x^2$</td>
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<td>m.c.m.</td>
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| 34 | $3x^2 + 3$  
$3x + 3$  
$6x^2 - 6$ | $MCD: 3(x + 1)$  
mcm: $6(x - 1)(x + 1)(x^2 - x + 1)$ |
| 35 | $ax + x + a^2 + a$  
$x^3 + a^3 + 3a^2 x + 3ax^2$  
$ax - x + a^2 - a$ | $MCD: x + a$  
mcm: $(x + a)^3(a - 1)(a + 1)$ |
| 36 | $2(x - y)$  
$x^2 - y^2$  
$(x - y)^2$ | $MCD: x - y$  
mcm: $2(x + y)(x - y)^2$ |
| 37 | $4x^2 + y^2 - 4xy$  
$4x^2 + 4xy + y^2$  
$10x - 5y$ | $MCD: 1$  
mcm: $5(2x - y)^2(2x + y)^2$ |
| 38 | $(x - y)^2$  
$(x + y)^2(x - y)^2$  
$100x - 100y$ | $MCD: (x - y)$  
mcm: $100(x - y)^2(x + y)^2$ |
| 39 | $x^2 - 16y^2$  
$x^2 + ax - 4(xy + ay)$  
$3x^2 - 24xy + 48y^2$ | $MCD: x - 4y$  
mcm: $3(x - 4y)^2(x + 4y)(x + a)$ |
| 40 | $3a^2 + 3ab$  
$12a^3 - 12ab^2$  
$6a^4b + 6ab^4$ | $MCD: 3a(a + b)$  
mcm: $36ab(a^2 - b)^2(a^2 - ab + b^2)$ |
| 41 | $a^2 - 4b^2$  
$2a^3 - 4a^2 b$  
$(a - 2b)^2$ | $MCD: a - 2b$  
mcm: $2a^2(a - 2b^2)(a + 2b)$ |
| 42 | $a^6 - b^6$  
$a^2 - b^2$  
$a^3 + b^3$  
$a^3 - b^3$ | $MCD: 1$  
mcm: $(a^2 - b^3)(a^2 + ab + b^3)(a^2 - ab + b^3)$ |
| 43 | $3x^3 - 6x^2 - 45x$  
$2x^4 - 2x^3 - 40x^2$  
$6x^3 - 60x^2 + 150x$ | $MCD: x(x - 5)$  
mcm: $6x^2(x - 5)^2(x + 3)(x + 4)$ |
| 44 | $3x^4 + 3x^3 - 18x^2$  
$2x^5 + 4x^4 - 16x^3$  
$6x^4 - 24x^3 + 24x^2$ | $MCD: x^2(x - 2)$  
mcm: $6x^3(x - 2)^2(x + 3)(x + 4)$ |