1. Completa:

$3^{\mathbf{2}} - 10 = -1$ $\quad 13^{\mathbf{10}} : 13^3 = 13^7$ $\quad (-\mathbf{5}^2) \cdot (-2) = +50$

$\mathbf{4}^3 \cdot 7^3 = 28^3$ $\quad (-7)^5 : (-7)^{\mathbf{3}} = +49$ $\quad 1 - (\mathbf{-3})^3 = 28$

$-(\mathbf{-2})^5 = +32$ $\quad MCD\ (60;\ \mathbf{15}) = 15$ $\quad mcm\ (60; \mathbf{175}) = 2100$

$\left(-\frac{3}{4}\right)^6 : \left(-\frac{3}{4}\right)^{\mathbf{5}} = -\frac{3}{4}$ $\quad \left(\pm\frac{\mathbf{15}}{\mathbf{8}}\right)^6 \cdot \left(\frac{8}{15}\right)^6 = 1$ $\quad (+12)^7 : (-4)^{\mathbf{7}} = (-3)^{\mathbf{7}}$

2. Stabilisci se le seguenti affermazioni sono vere o false:

	V	F		V	F
$3^2 = 2^3$	☐	☑	$26^0 \leq 26$	☑	☐
$5^0 = 11^0$	☑	☐	$\lvert -6\rvert > \lvert -3\rvert$	☑	☐
$\frac{3}{2} : \frac{9}{16} = \left(\frac{3}{2} - 1\right) : \left(\frac{9}{16} - 1\right)$	☐	☑	$\frac{5}{4} \cdot 3 = \frac{15}{12}$	☐	☑
$(-3)^4 = -3^4$	☐	☑	$\frac{4}{5} - \left(-\frac{1}{5}\right) = \frac{1}{5} + \frac{4}{5}$	☑	☐
$\lvert -5\rvert \geq \lvert +5\rvert$	☑	☐	$\frac{3}{2} : \frac{9}{16} = 1 : \frac{3}{8}$	☑	☐
$a \cdot b > 0\ e\ a > 0 \rightarrow b > 0$	☑	☐	$a = -2 \rightarrow -a = 2$	☑	☐

3. Qual è il segno delle seguenti potenze?

	$(+4)^5$	$(-6)^3$	$(+7)^4$	$(-9)^8$	$(-3)^6$	-8^4	$(-2)^7$	-5^3	$-(-2)^9$	$-(-7)^8$
> 0	X		X	X	X				X	
< 0		X				X	X	X		X

4. Calcola:

$MCD\ (240; 270; 48)$ $\qquad mcm\ (136; 153; 425)$

Scompongo in fattori primi i numeri dati:

$240 = 2^4 \cdot 3 \cdot 5$ $\qquad 270 = 2 \cdot 3^3 \cdot 5$ $\qquad 48 = 2^4 \cdot 3$

$MCD(240; 270; 48) = 2 \cdot 3 = \mathbf{6}$

$136 = 2^3 \cdot 17$ $\qquad 153 = 3^2 \cdot 17$ $\qquad 425 = 5^2 \cdot 17$

$mcm(136; 153; 425) = \mathbf{2^3 \cdot 3^2 \cdot 5^2 \cdot 17}$

5. Semplifica le seguenti espressioni:

A. $(38-18^3\cdot 18^2:9^5)^{17}:(2^3\cdot 3^3)^5$

$=(38-18^5:9^5)^{17}:(6^3)^5=(38-2^5)^{17}:6^{15}=(38-32)^{17}:6^{15}=6^{17}:6^{15}=6^2=\mathbf{36}$

B. $[(-4)^3\cdot(+5)^3]^4:[(-16)^{12}:(+8)^{12}]$

$=[(-20)^3]^4:(-2)^{12}=(-20)^{12}:2^{12}=20^{12}:2^{12}=\mathbf{10^{12}}$

C. $-[(-2)^5]^3:[-6+5\cdot(-12+7-3):(-2\cdot 5)]^{12}$

$=-(-2)^{15}:[-6+5\cdot(-8):(-10)]^{12}=-(-2)^{15}:(-6+4)^{12}=-(-2)^{15}:(-2)^{12}=-(-2)^3=\mathbf{8}$

D. $[(8^3:4^3)^2:2^5+(5^8:5^6)^2:5^3]-\{[(3^2+3^3):2^2+(7^2+8^2-10^2)]:11\}$

$=[(2^3)^2:2^5+(5^2)^2:5^3]-\{[(9+27):4+(49+64-100)]:11\}=(2^6:2^5+5^4:5^3)-[(36:4+13):11]=$

$=2+5-(9+13):11=2+5-22:11=2+5-2=\mathbf{5}$

E. $[(9^3\cdot 2)^4\cdot 12^2]:[(3\cdot 16)^3:(8\cdot 12)^2]^4$

$=[(3^6\cdot 2)^4\cdot(2^2\cdot 3)^2]:[(3\cdot 2^4)^3:(2^3\cdot 2^2\cdot 3)^2]^4=(3^{24}\cdot 2^4\cdot 2^4\cdot 3^2):[3^3\cdot 2^{12}:(2^5\cdot 3)^2]^4=$

$=3^{26}\cdot 2^8:[3^3\cdot 2^{12}:(2^{10}\cdot 3^2)]^4=3^{26}\cdot 2^8:(3\cdot 2^2)^4=3^{26}\cdot 2^8:(2^8\cdot 3^4)=\mathbf{3^{22}}$

F. $\left[\frac{8}{7}\cdot\left(\frac{2}{3}\right)^{-1}:\frac{1}{14}\right]+\left[\frac{7}{36}+\left(\frac{5}{6}\right)^2\right]\cdot\left(\frac{3}{2}\right)^2:2$

$=\left[\frac{8}{7}\cdot\frac{3}{2}\cdot 14\right]+\left(\frac{7}{36}+\frac{25}{36}\right)\cdot\frac{9}{4}\cdot\frac{1}{2}=24+\frac{32}{36}\cdot\frac{9}{8}=24+1=\mathbf{25}$

G. $\{15-[(3^4)^2\cdot(3^5)^2:27^5+3]:[(2^3)^5:(2^7)^2]\}^{21}\cdot 15^{361}$

$=\{15-[3^8\cdot 3^{10}:(3^3)^5+3]:[2^{15}:2^{14}]\}^{21}\cdot 15^{361}=[15-(3^{18}:3^{15}+3):2]^{21}\cdot 15^{361}=$

$=[15-(3^3+3):2]^{21}\cdot 15^{361}=(15-30:2)^{21}\cdot 15^{361}=0^{21}\cdot 15^{361}=0\cdot 15^{361}=\mathbf{0}$

H. $\left[(5,\bar{4}-5{,}4)\cdot 3^2+(-3{,}1\bar{6})\cdot\left(-\frac{3}{19}\right)\right]:0{,}3$

$=\left[\left(\frac{49}{9}-\frac{27}{5}\right)\cdot 9+\left(-\frac{316-31}{90}\right)\cdot\left(-\frac{3}{19}\right)\right]:\frac{3}{10}=\left(\frac{245-243}{45}\cdot 9+\frac{285}{90}\cdot\frac{3}{19}\right)\cdot\frac{10}{3}=\left(\frac{2}{5}+\frac{1}{2}\right)\cdot\frac{10}{3}=\frac{9}{10}\cdot\frac{10}{3}=\mathbf{3}$

I. $\frac{\left[\left(\frac{3}{5}\right)^{-3}\right]^{-2}:\left(\frac{3}{5}\right)^{-8}}{\left[\left(\frac{3}{5}\right)^{-1}\cdot\left(\frac{3}{5}\right)^{-14}\right]^2}\cdot\left(\frac{125}{27}\right)^{-10}$

$=\left[\left(\frac{3}{5}\right)^6:\left(\frac{3}{5}\right)^{-8}\right]:\left[\left(\frac{3}{5}\right)^{-15}\right]^2\cdot\left[\left(\frac{5}{3}\right)^3\right]^{-10}=\left(\frac{3}{5}\right)^{14}:\left(\frac{3}{5}\right)^{-30}\cdot\left(\frac{5}{3}\right)^{-30}=\left(\frac{3}{5}\right)^{44}\cdot\left(\frac{3}{5}\right)^{30}=\left(\frac{3}{5}\right)^{\mathbf{74}}$