RACINES CARRÉES

2.1

I) Écrire sous la forme $a\sqrt{b}$: $(a\in\mathbb{R};b\in\mathbb{R})$

A $=\sqrt{300}$
B $=\sqrt{900}$
C $=\sqrt{3600}$
D $=\sqrt{1000000}$
E $=\sqrt{10^7}$
F $=\sqrt{1000}+\sqrt{0}$
G $=\sqrt{4\times10^8}$
H $=\sqrt{(-7)^2}$
I $=\sqrt{0{,}04}$
J $=\sqrt{10^6}$
K $=\sqrt{10^{-4}}$
L $=\sqrt{25\times10^{-8}}$
M $=\sqrt{(-1)^2}$
N $=\sqrt{0{,}08}$
O $=\sqrt{121}-\sqrt{49}$
P $=\sqrt{5^2-3^2}$
Q $=5\sqrt{4}+\sqrt{100}$
R $=\sqrt{(-13-7)^2}$
S $=\sqrt{(\pi-3)^2}$
T $=\sqrt{(3-\pi)^2}$
U $=(\sqrt{\pi-3})^2$
V $=\sqrt{5^2-4^2}$
W $=\sqrt{(1-\sqrt{2})^2}$
X $=\dfrac{\sqrt{2}}{\sqrt{0+\sqrt{1}}}$
Y $=(\sqrt{2}+1)(\sqrt{2}-1)$
Z $=\sqrt{5\times6\times25\times27\times10^3}$

II) Simplifier :

A $=2\sqrt{3}-\sqrt{300}+3\sqrt{12}$
B $=\sqrt{40}+\sqrt{90}-\sqrt{490}$
C $=\sqrt{18}+\sqrt{50}-\sqrt{32}+\sqrt{200}$
D $=\sqrt{250}-\sqrt{490}-2\sqrt{81}$
E $=\sqrt{2}+3\sqrt{8}-6\sqrt{50}$
F $=-4\sqrt{24}-\sqrt{6}+4\sqrt{54}+3\sqrt{24}$
G $=3\sqrt{2}(\sqrt{2}+1)$
H $=(2\sqrt{5}+2)(1-3\sqrt{5})$
I $=(5\sqrt{2}-4)(3-8\sqrt{2})$
J $=(3\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})$
K $=4\sqrt{54}-4\sqrt{6}+2\sqrt{24}+2\sqrt{24}$
L $=\sqrt{2}(\sqrt{2}-1)+\sqrt{3}(\sqrt{3}-\sqrt{6})$
M $=2\sqrt{7}(1-3\sqrt{7})(2\sqrt{7}-3)$
N $=(\sqrt{2}(1+\sqrt{3}))^2$
O $=(2-\sqrt{3})^2$
P $=(\sqrt{2}-\sqrt{5})^2$
Q $=(\sqrt{6}-\sqrt{8})^2$
R $=\dfrac{(\sqrt{45}+5)(\sqrt{5}-3)}{4}$
S $=\sqrt{5}\times\dfrac{(\sqrt{19}-\sqrt{13})(\sqrt{19}+\sqrt{13})}{6}$
T $=4\sqrt{3}+2\sqrt{48}$
U $=-2\sqrt{8}+3\sqrt{50}-7\sqrt{18}$
V $=3\sqrt{15}\times2\sqrt{35}-2\sqrt{84}-7\dfrac{\sqrt{105}}{\sqrt{5}}$
W $=\dfrac{\sqrt{7}}{\sqrt{6}}\times\left(\dfrac{\sqrt{14\times15}}{\sqrt{5}}\right)$
X $=\dfrac{\sqrt{12^2+9^2}}{\sqrt{(12^2+9^2)}}$
Y $=2\sqrt{21}\dfrac{\sqrt{75}}{\sqrt{35}\sqrt{20}}$
Z $=\sqrt{176}\times\left(\dfrac{\sqrt{99}}{\sqrt{49}}\right)$

III) Écrire sans racines au dénominateur :

A $=\sqrt{2}+\sqrt{\dfrac{1}{2}}-\sqrt{\dfrac{1}{8}}$
B $=\dfrac{\sqrt{3}}{\sqrt{3}-2}$
C $=\dfrac{1}{\sqrt{5}-\sqrt{3}}$
D $=\sqrt{\dfrac{30}{7}}\times\sqrt{\dfrac{21}{40}}$
E $=\dfrac{1}{\sqrt{5}+\sqrt{3}}$
F $=\dfrac{1+\sqrt{3}}{2-\sqrt{3}}$
G $=\dfrac{\sqrt{3}+3}{\sqrt{3}-3}$
H $=\dfrac{\sqrt{7}+\sqrt{5}}{\sqrt{7}-\sqrt{5}}$
I $=\dfrac{\sqrt{7}-\sqrt{5}}{\sqrt{7}+\sqrt{5}}$
J $=\dfrac{\sqrt{10}+\sqrt{5}}{\sqrt{10}-\sqrt{5}}$
K $=\dfrac{\sqrt{7}}{\sqrt{2}-\sqrt{7}}$
L $=\dfrac{4}{1+\sqrt{3}}$
M $=(\sqrt{3}-\sqrt{27}+\sqrt{12})\dfrac{\sqrt{3}}{\sqrt{54}}$
N $=\dfrac{3}{\sqrt{5}-2}$
O $=2\times\dfrac{\sqrt{5}}{1-\sqrt{45}}$
P $=\dfrac{\sqrt{63}-5\sqrt{7}}{\sqrt{28}}$
Q $=\dfrac{\sqrt{243}-\sqrt{147}}{\sqrt{12}}$
R $=\dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}+\dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$
S $=\dfrac{\sqrt{(-7)^2}}{4\sqrt{2}-\sqrt{8}}$

IV) Simplifier :

A $=\dfrac{2\sqrt{21}\sqrt{75\,a^2}}{\sqrt{35}\sqrt{20}}$
B $=\left(\dfrac{\sqrt{10-2\sqrt{5}}}{4}\right)^2+\left(\dfrac{1+\sqrt{5}}{4}\right)^2$
C $=(\sqrt{2}-\sqrt{3})(5\sqrt{2}-\sqrt{3})-(3\sqrt{6}+1)^2$
D $=(\sqrt{2}+\sqrt{7})^3$
E $=\left(\sqrt{\dfrac{5}{3}}-\sqrt{\dfrac{3}{5}}\right)^2$
F $=\dfrac{(\sqrt{3}-2)^2}{\sqrt{7}}\times\dfrac{7+4\sqrt{3}}{\sqrt{14}}$
G $=(\sqrt{5})^3(\sqrt{5})^3(\sqrt{2})^3$
H $=(2a+\sqrt{b})^2+(1-2a\sqrt{b})^2-(2a\sqrt{b})^2$
I $=\dfrac{\sqrt{3}}{\sqrt{3}-\dfrac{2}{\sqrt{3}-\dfrac{2}{\sqrt{3}}}}$
J $=\dfrac{3\sqrt{5}+\sqrt{20}}{\sqrt{45}\left(2-\dfrac{5}{6}+\dfrac{4}{3}\right)(1-\sqrt{3})}$
K $=(4+3\sqrt{2})^2-(2+\sqrt{2})(\sqrt{2}-1)$
L $=\sqrt{\dfrac{7+4\sqrt{3}}{7-4\sqrt{3}}}+\sqrt{\dfrac{7-4\sqrt{3}}{7+4\sqrt{3}}}$
M $=\dfrac{\sqrt{0{,}04}}{\sqrt{0{,}0016}}+\dfrac{\sqrt{0{,}01}}{\sqrt{0{,}04}}$
N $=(\sqrt{2-\sqrt{2}}+\sqrt{2+\sqrt{2}})^2$
O $=\sqrt{\dfrac{a^6+a^6+a^6+a^6}{5^2+5^2+5^2+5^2}}$
P $=\sqrt{6-\sqrt{6-\sqrt{6-\sqrt{6-\sqrt{\dfrac{4\sqrt{27}}{3\sqrt{3}}}}}}}$
Q $=\sqrt{\dfrac{48\,a^6b^{12}}{243(ab)^4}}$
R $=\sqrt{\dfrac{4^{80}+5\times8^{53}}{28\times2^{155}}}$
S $=(\sqrt{1+\sqrt{1-a^2}}+\sqrt{1-\sqrt{1-a^2}})^2$ $(a\in[0\,;1])$