

EXERCICE 1 : Compléter les pointillés :

a.	$3^2 = 9$	donc	$\sqrt{9} = 3$
b.	$17^2 = 289$	donc	$\sqrt{\dots} = \dots$
c.	$4^2 = \dots$	donc	$\sqrt{\dots} = 4$
d.	$12^2 = 144$	donc	$\sqrt{\dots} = \dots$
e.	$6^2 = \dots$	donc	$\sqrt{\dots} = \dots$
f.	$\dots^2 = 16$	donc	$\sqrt{\dots} = \dots$
g.	$\dots^2 = \dots$	donc	$\sqrt{25} = \dots$
h.	$7^2 = \dots$	donc	$\sqrt{\dots} = \dots$
i.	$\dots^2 = 81$	donc	$\sqrt{\dots} = \dots$
j.	$\dots^2 = \dots$	donc	$\sqrt{64} = \dots$

EXERCICE 2 : Calculer mentalement :

a. $\sqrt{4} = 2$	b. $\sqrt{100} =$
c. $\sqrt{900} =$	d. $\sqrt{0,01} =$
e. $\sqrt{(3,14)^2} =$	f. $\sqrt{\left(\frac{2}{5}\right)^2} =$
g. $\sqrt{\frac{9}{25}} =$	h. $\sqrt{\frac{49}{36}} =$
i. $\sqrt{\frac{1}{81}} =$	j. $\sqrt{\frac{121}{100}} =$

EXERCICE 3 : Calculer mentalement :

a. $\sqrt{3\,600} =$	b. $\sqrt{0,04} =$
c. $\sqrt{1000000} =$	d. $\sqrt{10^6} =$
e. $\sqrt{10^{14}} =$	f. $\sqrt{10^{-4}} =$
g. $\sqrt{4 \times 10^8} =$	h. $\sqrt{25 \times 10^{-12}} =$
i. $\sqrt{(-7)^2} =$	j. $\sqrt{(-1)^2} =$

EXERCICE 4 : Réduire les expressions :

$$3\sqrt{2} + 5\sqrt{2} - 7\sqrt{2} + 2\sqrt{2} = (3+5-7+2)\sqrt{2} = 3\sqrt{2}$$

$$5\sqrt{5} - 6\sqrt{3} - 8\sqrt{3} + \sqrt{5} =$$

$$-4\sqrt{11} + 11\sqrt{11} + 13\sqrt{11} =$$

$$3\sqrt{7} - 3\sqrt{5} - 5\sqrt{7} + 7\sqrt{5} =$$

$$-8\sqrt{2} - 2\sqrt{11} + 3\sqrt{11} - 7\sqrt{2} =$$

EXERCICE 5 : Calculer les produits :

$\sqrt{2} \times 3\sqrt{2} = 3 \times \sqrt{2} \times \sqrt{2}$ $= 3 \times 2 = 6$	$2\sqrt{7} \times 5\sqrt{7}$ $= 2 \times 5 \times \sqrt{7} \times \sqrt{7}$ $= 10 \times 7 = 70$
$3\sqrt{5} \times 4\sqrt{5} =$	$-\sqrt{2} \times \sqrt{2} =$
$-3\sqrt{2} \times (-5\sqrt{2}) =$	$7\sqrt{3} \times (-2\sqrt{3}) =$
$5\sqrt{5} \times (-2\sqrt{5}) =$	$\sqrt{2} \times \sqrt{2} \times \sqrt{2} =$

EXERCICE 6 : Calculer les carrés :

$\sqrt{5^2} = 5$	$(3\sqrt{2})^2 =$
$(-2\sqrt{3})^2 =$	$(2\sqrt{11})^2 =$
$(5\sqrt{2})^2 =$	$(6\sqrt{3})^2 =$
$(-2\sqrt{7})^2 =$	$(-9\sqrt{11})^2 =$

EXERCICE 7 : Écrire sous la forme « a + b√c » (a, b et c sont des entiers relatifs) :

$$2(3 + \sqrt{5}) = 2 \times 3 + 2 \times \sqrt{5} = 6 + 2\sqrt{5}$$

$$3(6 - \sqrt{2}) =$$

$$5(3\sqrt{2} + 4) =$$

$$-3(5\sqrt{3} - 7) =$$

$$\sqrt{3}(4 + \sqrt{3}) =$$

$$3\sqrt{2}(4 + \sqrt{2}) =$$

$$2\sqrt{3}(5 - 2\sqrt{3}) =$$

$$-2\sqrt{5}(3\sqrt{5} + 2) =$$

$$5\sqrt{7}(-4 + 3\sqrt{7}) =$$

$$-9\sqrt{11}(-2\sqrt{11} - 6) =$$

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CORRIGE

EXERCICE 1 :

a.	$3^2 = 9$	donc	$\sqrt{9} = 3$
b.	$17^2 = 289$	donc	$\sqrt{289} = 17$
c.	$4^2 = 16$	donc	$\sqrt{16} = 4$
d.	$12^2 = 144$	donc	$\sqrt{144} = 12$
e.	$6^2 = 36$	donc	$\sqrt{36} = 6$
f.	$4^2 = 16$	donc	$\sqrt{16} = 4$
g.	$5^2 = 25$	donc	$\sqrt{25} = 5$
h.	$7^2 = 49$	donc	$\sqrt{49} = 7$
i.	$9^2 = 81$	donc	$\sqrt{81} = 9$
j.	$8^2 = 64$	donc	$\sqrt{64} = 8$

EXERCICE 2 :

a.	$\sqrt{4} = 2$	b.	$\sqrt{100} = 10$
c.	$\sqrt{900} = 30$	d.	$\sqrt{0,01} = 0,1$
e.	$\sqrt{(3,14)^2} = 3,14$	f.	$\sqrt{\left(\frac{2}{5}\right)^2} = \frac{2}{5}$
g.	$\sqrt{\frac{9}{25}} = \frac{3}{5}$	h.	$\sqrt{\frac{49}{36}} = \frac{7}{6}$
i.	$\sqrt{\frac{1}{81}} = \frac{1}{9}$	j.	$\sqrt{\frac{121}{100}} = \frac{11}{10}$

EXERCICE 3 :

a.	$\sqrt{3600} = 60$	b.	$\sqrt{0,04} = 0,2$
c.	$\sqrt{1000000} = 1000$	d.	$\sqrt{10^6} = 10^3$
e.	$\sqrt{10^{14}} = 10^7$	f.	$\sqrt{10^{-4}} = 10^{-2}$
g.	$\sqrt{4 \times 10^8} = 2 \times 10^4$	h.	$\sqrt{25 \times 10^{-12}} = 5 \times 10^{-6}$
i.	$\sqrt{(-7)^2} = 7$	j.	$\sqrt{(-1)^2} = 1$

EXERCICE 4 :

$3\sqrt{2} + 5\sqrt{2} - 7\sqrt{2} + 2\sqrt{2} = (3+5-7+2)\sqrt{2} = 3\sqrt{2}$
$5\sqrt{5} - 6\sqrt{3} - 8\sqrt{3} + \sqrt{5} = 6\sqrt{5} - 14\sqrt{3}$
$-4\sqrt{11} + 11\sqrt{11} + 13\sqrt{11} = (-4+11+13)\sqrt{11} = 20\sqrt{11}$
$3\sqrt{7} - 3\sqrt{5} - 5\sqrt{7} + 7\sqrt{5} = -2\sqrt{7} + 4\sqrt{5}$
$-8\sqrt{2} - 2\sqrt{11} + 3\sqrt{11} - 7\sqrt{2} = -15\sqrt{2} + \sqrt{11}$

EXERCICE 5 :

$\sqrt{2} \times 3\sqrt{2} = 3 \times \sqrt{2} \times \sqrt{2}$ $= 3 \times 2 = 6$	$2\sqrt{7} \times 5\sqrt{7}$ $= 2 \times 5 \times \sqrt{7} \times \sqrt{7}$ $= 10 \times 7 = 70$
$3\sqrt{5} \times 4\sqrt{5}$ $= 3 \times 4 \times \sqrt{5} \times \sqrt{5}$ $= 12 \times 5 = 60$	$-\sqrt{2} \times \sqrt{2} = -2$
$-3\sqrt{2} \times (-5\sqrt{2})$ $= (-3) \times (-5) \times \sqrt{2} \times \sqrt{2}$ $= 15 \times 2 = 30$	$7\sqrt{3} \times (-2\sqrt{3})$ $= 7 \times (-2) \times \sqrt{3} \times \sqrt{3}$ $= -14 \times 3 = -42$
$5\sqrt{5} \times (-2\sqrt{5}) =$ $= 5 \times (-2) \times \sqrt{5} \times \sqrt{5}$ $= -10 \times 5 = -50$	$\sqrt{2} \times \sqrt{2} \times \sqrt{2} = 2\sqrt{2}$

EXERCICE 6 :

$\sqrt{5^2} = 5$	$(3\sqrt{2})^2 = 3 \times 3 \times \sqrt{2} \times \sqrt{2}$ $= 9 \times 2 = 18$
$(-2\sqrt{3})^2 = 2 \times 2 \times \sqrt{3} \times \sqrt{3}$ $= 4 \times 3 = 11$	$(2\sqrt{11})^2 = 2 \times 2 \times \sqrt{11} \times \sqrt{11}$ $= 4 \times 11 = 44$
$(5\sqrt{2})^2 = 5 \times 5 \times \sqrt{2} \times \sqrt{2}$ $= 25 \times 2 = 50$	$(6\sqrt{3})^2 = 6 \times 6 \times \sqrt{3} \times \sqrt{3}$ $= 36 \times 3 = 108$
$(-2\sqrt{7})^2 = 2 \times 2 \times \sqrt{7} \times \sqrt{7}$ $= 4 \times 7 = 28$	$(-9\sqrt{11})^2 = 9 \times 9 \times \sqrt{11} \times \sqrt{11}$ $= 81 \times 11 = 891$

EXERCICE 7 :

$$2(3 + \sqrt{5}) = 2 \times 3 + 2 \times \sqrt{5} = 6 + 2\sqrt{5}$$

$$3(6 - \sqrt{2}) = 3 \times 6 - 3 \times \sqrt{2} = 18 - 3\sqrt{2}$$

$$5(3\sqrt{2} + 4) = 5 \times 3\sqrt{2} + 5 \times 4 = 15\sqrt{2} + 20$$

$$-3(5\sqrt{3} - 7) = -3 \times 5\sqrt{3} - 3 \times (-7) = -15\sqrt{3} + 21$$

$$\sqrt{3}(4 + \sqrt{3}) = \sqrt{3} \times 4 + \sqrt{3} \times \sqrt{3} = 4\sqrt{3} + 3$$

$$\begin{aligned} 3\sqrt{2}(4 + \sqrt{2}) &= 3\sqrt{2} \times 4 + 3\sqrt{2} \times \sqrt{2} \\ &= 3 \times 4 \times \sqrt{2} + 3 \times 2 = 12\sqrt{2} + 6 \end{aligned}$$

$$\begin{aligned} 2\sqrt{3}(5 - 2\sqrt{3}) &= 2\sqrt{3} \times 5 - 2\sqrt{3} \times 2\sqrt{3} \\ &= 2 \times 5 \times \sqrt{3} - 2 \times 2 \times \sqrt{3} \times \sqrt{3} = 10\sqrt{3} - 4 \times 3 \\ &= 10\sqrt{3} - 12 \end{aligned}$$

$$\begin{aligned} -2\sqrt{5}(3\sqrt{5} + 2) &= -2\sqrt{5} \times 3\sqrt{5} - 2\sqrt{5} \times 2 \\ &= -2 \times 3 \times \sqrt{5} \times \sqrt{5} - 2 \times 2 \times \sqrt{5} = -6 \times 5 - 4\sqrt{5} \\ &= -30 - 4\sqrt{5} \end{aligned}$$

$$\begin{aligned} 5\sqrt{7}(-4 + 3\sqrt{7}) &= 5\sqrt{7} \times (-4) + 5\sqrt{7} \times 3\sqrt{7} \\ &= 5 \times (-4) \times \sqrt{7} + 3 \times 5 \times \sqrt{7} \times \sqrt{7} \\ &= -20\sqrt{7} + 15 \times 7 = -20\sqrt{7} + 105 \end{aligned}$$

$$\begin{aligned} -9\sqrt{11}(-2\sqrt{11} - 6) &= -9\sqrt{11} \times (-2\sqrt{11}) - 9\sqrt{11} \times (-6) \\ &= -9 \times (-2) \times \sqrt{11} \times \sqrt{11} - 9 \times (-6) \times \sqrt{11} \\ &= 18 \times 11 + 54\sqrt{11} = 198 + 54\sqrt{11} \end{aligned}$$