

Derivatives of elementary functions – ANSWERS [A]

1 - Complete the following array. (One supposes that u & v are derivable functions of derivatives u' et v' ..

$f(x) =$	$3x^2 + 4x + 2$	$-\frac{2}{x}$ <small>$(x \neq 0)$</small>	x^3	$2\sqrt{x}$ <small>$(x > 0)$</small>	$k.u$	u^n	$\frac{1}{u}$	$u.v$	$\frac{u}{v}$	\sqrt{u}
$f'(x) =$	$6x + 4$	$\frac{2}{x^2}$	$3x^2$	$\frac{1}{\sqrt{x}}$	$k.u'$	$n.u^{n-1}u'$	$-\frac{u'}{u^2}$	$u'v + uv'$	$\frac{u'v - uv'}{v^2}$	$\frac{u'}{2\sqrt{u}}$

2 - Complete the following array by using the previous formulas.

$f(x) =$	$3x^4$	$\frac{2}{3x}$ <small>$(x \neq 0)$</small>	$\frac{4}{3}x^3$	$\sqrt{9x}$ <small>$(x > 0)$</small>	$\frac{1}{2x^2}$ <small>$(x \neq 0)$</small>	$\frac{-3}{2x^3}$ <small>$(x \neq 0)$</small>
$f'(x) =$	$12x^3$	$-\frac{2}{3x^2}$	$4x^2$	$\frac{3}{2\sqrt{x}}$	$-\frac{1}{x^3}$	$\frac{9}{2x^4}$

3 - Compute the following derivatives. (Show all calculations on back)

$f(x) =$	$-\frac{4}{3x^2 + 2}$	$\left(\frac{2}{3}x^3 + \frac{1}{2}x^2\right)^3$	$\frac{3x+4}{x-2}$	$\sqrt{\frac{3x+4}{x-2}}$	$\frac{2x^2 + 2x - 4}{x^2 - 3x + 1}$
$f'(x) =$	$\frac{24x}{(3x^2 + 2)^2}$	$3\left(\frac{2}{3}x^3 + \frac{1}{2}x^2\right)^2(2x^2 + x)$	$-\frac{10}{(x-2)^2}$	$\frac{-5}{\sqrt{(x-2)^3(3x+4)}}$	$\frac{-2(4x^2 - 6x + 5)}{(x^2 - 3x + 1)^2}$

Derivatives of elementary functions – ANSWERS [B]

1 - Complete the following array. (One supposes that u & v are derivable functions of derivatives u' et v' ..

$f(x) =$	$4x^2 + 3x + 1$	$\frac{4}{x}$ <small>$(x \neq 0)$</small>	x^4	$\frac{\sqrt{x}}{2}$ <small>$(x > 0)$</small>	$k.u$	u^n	$\frac{1}{u}$	$u.v$	$\frac{u}{v}$	\sqrt{u}
$f'(x) =$	$8x + 3$	$-\frac{4}{x^2}$	$4x^3$	$\frac{1}{4\sqrt{x}}$	$k.u'$	$n.u^{n-1}u'$	$-\frac{u'}{u^2}$	$u'v + uv'$	$\frac{u'v - uv'}{v^2}$	$\frac{u'}{2\sqrt{u}}$

2 - Complete the following array by using the previous formulas.

$f(x) =$	$4x^5$	$\frac{3}{2x}$ <small>$(x \neq 0)$</small>	$\frac{3}{4}x^3$	$\sqrt{4x}$ <small>$(x > 0)$</small>	$\frac{1}{4x^2}$ <small>$(x \neq 0)$</small>	$\frac{-2}{3x^3}$ <small>$(x \neq 0)$</small>
$f'(x) =$	$20x^4$	$-\frac{3}{2x^2}$	$\frac{9}{4}x^2$	$\frac{1}{\sqrt{x}}$	$-\frac{1}{2x^3}$	$\frac{2}{x^4}$

3 - Compute the following derivatives. (Show all calculations on back)

$f(x) =$	$-\frac{3}{4x^2+1}$	$\left(\frac{3}{4}x^4 + \frac{3}{2}x^2\right)^3$	$\frac{4x+3}{x+2}$	$\sqrt{\frac{4x+3}{x+2}}$	$\frac{x^2-3x+1}{2x^2+2x-4}$
$f'(x) =$	$\frac{24x}{(4x^2+1)^2}$	$3\left(\frac{3}{4}x^4 + \frac{3}{2}x^2\right)^2(3x^3+3x)$	$\frac{5}{(x+2)^2}$	$\frac{5}{2\sqrt{(x+2)^3(4x+3)}}$	$\frac{4x^2-6x+5}{2(x+2)^2(x-1)^2}$