

3.2  $g(t) = \arcsin(2t\sqrt{1-t^2})$      $u(t) = 2t\sqrt{1-t^2}$      $D_u = [-1, 1]$

$$u'(t) = 2\sqrt{1-t^2} + 2t \cdot \frac{1}{2\sqrt{1-t^2}} \cdot (-2t) = 2\sqrt{1-t^2} - \frac{2t^2}{\sqrt{1-t^2}} = \frac{2(1-t^2) - 2t^2}{\sqrt{1-t^2}} = \frac{2(1-2t^2)}{\sqrt{1-t^2}}$$

$u'$  s'annule en  $\pm \frac{1}{\sqrt{2}}$

$t$	-1	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
$u'$	-	0	+	0
$u$	0	$\searrow$	$\nearrow$	0
		-1	1	

$u(1) = u(-1) = 0$

$u(\frac{1}{\sqrt{2}}) = \frac{2}{\sqrt{2}} \sqrt{1 - \frac{1}{2}} = \frac{2}{\sqrt{2}} \sqrt{\frac{1}{2}} = 1$

donc  $u$  va de  $[-1, 1]$  dans  $[-1, 1]$ .     $D_g = [-1, 1]$

$$g'(t) = \frac{1}{\sqrt{1 - (2t\sqrt{1-t^2})^2}} \cdot u'(t) = \frac{1}{\sqrt{1 - 4t^2 + 4t^4}} \cdot \frac{2(1-2t^2)}{\sqrt{1-t^2}}$$

$$= \frac{1}{|1-2t^2|} \cdot \frac{2(1-2t^2)}{\sqrt{1-t^2}} = \begin{cases} \frac{2}{\sqrt{1-t^2}} & \text{qd } 1-2t^2 > 0 \quad (t \in ]-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}[) \\ -\frac{2}{\sqrt{1-t^2}} & \text{qd } 1-2t^2 < 0 \quad (t \notin ]-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}[) \end{cases}$$

$g'(t) = \pm \frac{2}{\sqrt{1-t^2}}$

3.1  $f(t) = \arctan(t) + \arctan(\frac{1}{t})$      $D_f = \mathbb{R}^*$

$$f'(t) = \frac{1}{1+t^2} + \frac{1}{1+\frac{1}{t^2}} \cdot \left(-\frac{1}{t^2}\right) = \frac{1}{1+t^2} - \frac{1}{t^2+1} = 0$$

$f'(t) = 0$

$f(1) = \frac{\pi}{4} + \frac{\pi}{4} = \frac{\pi}{2}$  et  $f(-1) = -\frac{\pi}{4} - \frac{\pi}{4} = -\frac{\pi}{2}$

