

## CONVERSIONES DE GRADOS A RADIANES Y VICEVERSA

### Ejemplos

1. Realice las siguientes conversiones de grados a radianes:

- a)  $-143^\circ$
- b)  $260^\circ$
- c)  $-115^\circ$
- d)  $-236^\circ$
- e)  $328^\circ$
- f)  $410^\circ$

### Solución

<b>A</b>	$\frac{\pi}{180^\circ} = \frac{x}{-143^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -143^\circ = x$ $\Rightarrow \frac{-143\pi}{180} = x$
<b>B</b>	$\frac{\pi}{180^\circ} = \frac{x}{260^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 260^\circ = x$ $\Rightarrow \frac{13\pi}{9} = x$
<b>C</b>	$\frac{\pi}{180^\circ} = \frac{x}{-115^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -115^\circ = x$ $\Rightarrow \frac{-23\pi}{36} = x$

<b>D</b>	$\frac{\pi}{180^\circ} = \frac{x}{-236^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -236^\circ = x$ $\Rightarrow \frac{-59\pi}{45} = x$
<b>E</b>	$\frac{\pi}{180^\circ} = \frac{x}{328^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 328^\circ = x$ $\Rightarrow \frac{82\pi}{45} = x$
<b>F</b>	$\frac{\pi}{180^\circ} = \frac{x}{410^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 410^\circ = x$ $\Rightarrow \frac{41\pi}{18} = x$

2. Realice las siguientes conversiones de radianes a grados:

a)  $\frac{21\pi}{4}$

b)  $\frac{-6\pi}{5}$

c)  $\frac{107\pi}{45}$

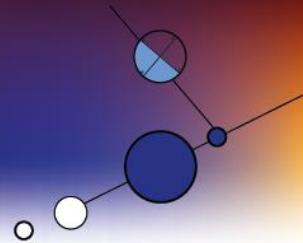
d)  $\frac{11\pi}{10}$

e)  $\frac{-109\pi}{60}$

f)  $\frac{47\pi}{36}$

## Solución

<b>A</b>	$\frac{\pi}{180^\circ} = \frac{21\pi}{4x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{21\pi}{4}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{21\pi}{4} = x$ $\Rightarrow 945^\circ = x$
<b>B</b>	$\frac{\pi}{180^\circ} = \frac{-6\pi}{5x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{-6\pi}{5}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-6\pi}{5} = x$ $\Rightarrow -216^\circ = x$
<b>C</b>	$\frac{\pi}{180^\circ} = \frac{107\pi}{45x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{107\pi}{45}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{107\pi}{45} = x$ $\Rightarrow 428^\circ = x$
<b>D</b>	$\frac{\pi}{180^\circ} = \frac{11\pi}{10x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{11\pi}{10}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{11\pi}{10} = x$ $\Rightarrow 198^\circ = x$



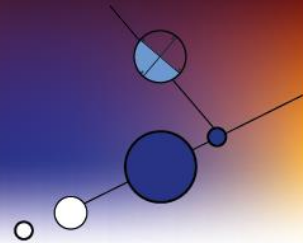
<b>E</b>	$\frac{\pi}{180^\circ} = \frac{-109\pi}{60}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{-109\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-109\pi}{60} = x$ $\Rightarrow -327^\circ = x$
<b>F</b>	$\frac{\pi}{180^\circ} = \frac{47\pi}{36}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{47\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{47\pi}{36} = x$ $\Rightarrow 235^\circ = x$

3. Asocie cada medida en grados con su correspondiente medida en radianes, escribiendo la letra correspondiente dentro del paréntesis.

<b>A</b>	-465°	( ) $\frac{71\pi}{45}$
<b>B</b>	284°	( ) $\frac{-83\pi}{36}$
<b>C</b>	723°	( ) $\frac{-53\pi}{18}$
<b>D</b>	-415°	( ) $\frac{-31\pi}{12}$
<b>E</b>	-530°	( ) $\frac{7\pi}{6}$
<b>F</b>	210°	( ) $\frac{241\pi}{60}$

## Solución

<b>A</b>	$\frac{\pi}{180^\circ} = \frac{x}{-465^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -465^\circ = x$ $\Rightarrow \frac{-31\pi}{12} = x$	<b>(B)</b> $\frac{71\pi}{45}$
<b>B</b>	$\frac{\pi}{180^\circ} = \frac{x}{284^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 284^\circ = x$ $\Rightarrow \frac{71\pi}{45} = x$	<b>(D)</b> $\frac{-83\pi}{36}$
<b>C</b>	$\frac{\pi}{180^\circ} = \frac{x}{723^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 723^\circ = x$ $\Rightarrow \frac{241\pi}{60} = x$	<b>(E)</b> $\frac{-53\pi}{18}$
<b>D</b>	$\frac{\pi}{180^\circ} = \frac{x}{-415^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -415^\circ = x$ $\Rightarrow \frac{-83\pi}{36} = x$	<b>(A)</b> $\frac{-31\pi}{12}$
<b>E</b>	$\frac{\pi}{180^\circ} = \frac{x}{-530^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -530^\circ = x$ $\Rightarrow \frac{-53\pi}{18} = x$	<b>(F)</b> $\frac{7\pi}{6}$



<b>F</b>	$\frac{\pi}{180^\circ} = \frac{x}{210^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 210^\circ = x$ $\Rightarrow \frac{7\pi}{6} = x$	(C) $\frac{241\pi}{60}$
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4. Asocie cada medida en radianes con su correspondiente medida en grados, escribiendo la letra correspondiente dentro del paréntesis.

<b>A</b>	$\frac{79\pi}{90}$	( ) 425°
<b>B</b>	$\frac{-7\pi}{4}$	( ) - 220°
<b>C</b>	$\frac{85\pi}{36}$	( ) - 315°
<b>D</b>	$\frac{-11\pi}{9}$	( ) - 385°
<b>E</b>	$\frac{71\pi}{30}$	( ) 426°
<b>F</b>	$\frac{-77\pi}{36}$	( ) 158°

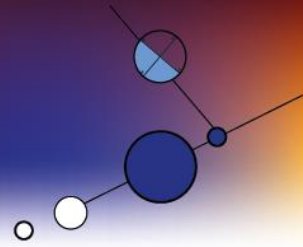
**Solución**

<b>A</b>	$\frac{\pi}{180^\circ} = \frac{79\pi}{90}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{79\pi}{90}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{79\pi}{90} = x$ $\Rightarrow 158^\circ = x$	(C) 425°
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<b>B</b>	$\frac{\pi}{180^\circ} = \frac{-7\pi}{x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{-7\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-7\pi}{4} = x$ $\Rightarrow -315^\circ = x$	(D) $-220^\circ$
<b>C</b>	$\frac{\pi}{180^\circ} = \frac{85\pi}{36x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{85\pi}{36}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{85\pi}{36} = x$ $\Rightarrow 425^\circ = x$	(B) $-315^\circ$
<b>D</b>	$\frac{\pi}{180^\circ} = \frac{-11\pi}{9x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{-11\pi}{9}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-11\pi}{9} = x$ $\Rightarrow -220^\circ = x$	(F) $-385^\circ$
<b>E</b>	$\frac{\pi}{180^\circ} = \frac{71\pi}{30x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{71\pi}{30}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{71\pi}{30} = x$ $\Rightarrow 426^\circ = x$	(E) $426^\circ$

<b>F</b>	$\frac{\pi}{180^\circ} = \frac{-77\pi}{36x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{-77\pi}{36}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-77\pi}{36} = x$ $\Rightarrow -385^\circ = x$	(A) 158°
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## Ejercicios

1. Realice las siguientes conversiones de grados a radianes:

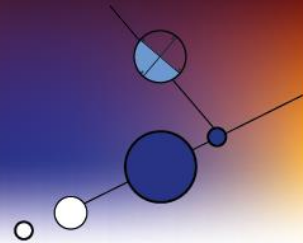
- a)  $-645^\circ$
- b)  $524^\circ$
- c)  $480^\circ$
- d)  $-390^\circ$
- e)  $-425^\circ$
- f)  $385^\circ$

2. Realice las siguientes conversiones de radianes a grados:

- a)  $\frac{103\pi}{45}$
- b)  $\frac{25\pi}{12}$
- c)  $\frac{-64\pi}{45}$
- d)  $\frac{-14\pi}{9}$
- e)  $\frac{-73\pi}{18}$
- f)  $\frac{65\pi}{18}$

3. Asocie cada medida en grados con su correspondiente medida en radianes, escribiendo la letra correspondiente dentro del paréntesis.

<b>A</b>	$-230^\circ$	$( \quad ) \frac{13\pi}{18}$
<b>B</b>	$515^\circ$	$( \quad ) \frac{-77\pi}{90}$
<b>C</b>	$130^\circ$	$( \quad ) \frac{181\pi}{90}$



<b>D</b>	$-245^\circ$	$( \quad ) \frac{-23\pi}{18}$
<b>E</b>	$-154^\circ$	$( \quad ) \frac{-49\pi}{36}$
<b>F</b>	$362^\circ$	$( \quad ) \frac{103\pi}{36}$

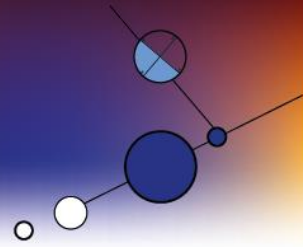
4. Asocie cada medida en radianes con su correspondiente medida en grados, escribiendo la letra correspondiente dentro del paréntesis.

<b>A</b>	$\frac{43\pi}{18}$	$( \quad ) 475^\circ$
<b>B</b>	$\frac{-97\pi}{36}$	$( \quad ) 490^\circ$
<b>C</b>	$\frac{95\pi}{36}$	$( \quad ) -485^\circ$
<b>D</b>	$\frac{-83\pi}{36}$	$( \quad ) -412^\circ$
<b>E</b>	$\frac{49\pi}{18}$	$( \quad ) -415^\circ$
<b>F</b>	$\frac{-103\pi}{45}$	$( \quad ) 430^\circ$

Soluciones

1.

<b>A</b>	$\frac{\pi}{180^\circ} = \frac{x}{-645^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -645^\circ = x$ $\Rightarrow \frac{-43\pi}{12} = x$
<b>B</b>	$\frac{\pi}{180^\circ} = \frac{x}{524^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 524^\circ = x$ $\Rightarrow \frac{131\pi}{45} = x$
<b>C</b>	$\frac{\pi}{180^\circ} = \frac{x}{480^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 480^\circ = x$ $\Rightarrow \frac{8\pi}{3} = x$
<b>D</b>	$\frac{\pi}{180^\circ} = \frac{x}{-390^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -390^\circ = x$ $\Rightarrow \frac{-13\pi}{6} = x$
<b>E</b>	$\frac{\pi}{180^\circ} = \frac{x}{-425^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -425^\circ = x$ $\Rightarrow \frac{-85\pi}{36} = x$



**F**

$$\frac{\pi}{180^\circ} = \frac{x}{385^\circ}$$

$$\Rightarrow \frac{\pi}{180^\circ} \cdot 385^\circ = x$$

$$\Rightarrow \frac{77\pi}{36} = x$$

2.

**A**

$$\frac{\pi}{180^\circ} = \frac{\frac{103\pi}{45}}{x}$$

$$\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{103\pi}{45}}$$

$$\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{103\pi}{45} = x$$

$$\Rightarrow 412^\circ = x$$

**B**

$$\frac{\pi}{180^\circ} = \frac{\frac{25\pi}{12}}{x}$$

$$\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{25\pi}{12}}$$

$$\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{25\pi}{12} = x$$

$$\Rightarrow 375^\circ = x$$

**C**

$$\frac{\pi}{180^\circ} = \frac{\frac{-64\pi}{45}}{x}$$

$$\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{-64\pi}{45}}$$

$$\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-64\pi}{45} = x$$

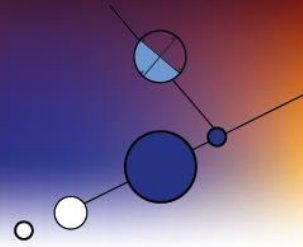
$$\Rightarrow -256^\circ = x$$

<b>D</b>	$\frac{\pi}{180^\circ} = \frac{-14\pi}{x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{-14\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-14\pi}{9} = x$ $\Rightarrow -280^\circ = x$
<b>E</b>	$\frac{\pi}{180^\circ} = \frac{-73\pi}{x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{-73\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-73\pi}{18} = x$ $\Rightarrow -730^\circ = x$
<b>F</b>	$\frac{\pi}{180^\circ} = \frac{65\pi}{x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{65\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{65\pi}{18} = x$ $\Rightarrow 650^\circ = x$

3.

<b>A</b>	$\frac{\pi}{180^\circ} = \frac{x}{-230^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -230^\circ = x$ $\Rightarrow \frac{-23\pi}{18} = x$	(C) $\frac{13\pi}{18}$
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<b>B</b>	$\frac{\pi}{180^\circ} = \frac{x}{515^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 515^\circ = x$ $\Rightarrow \frac{103\pi}{36} = x$	<b>(E)</b> $\frac{-77\pi}{90}$
<b>C</b>	$\frac{\pi}{180^\circ} = \frac{x}{130^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 130^\circ = x$ $\Rightarrow \frac{13\pi}{18} = x$	<b>(F)</b> $\frac{181\pi}{90}$
<b>D</b>	$\frac{\pi}{180^\circ} = \frac{x}{-245^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -245^\circ = x$ $\Rightarrow \frac{-49\pi}{36} = x$	<b>(A)</b> $\frac{-23\pi}{18}$
<b>E</b>	$\frac{\pi}{180^\circ} = \frac{x}{-154^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot -154^\circ = x$ $\Rightarrow \frac{-77\pi}{90} = x$	<b>(D)</b> $\frac{-49\pi}{36}$
<b>F</b>	$\frac{\pi}{180^\circ} = \frac{x}{362^\circ}$ $\Rightarrow \frac{\pi}{180^\circ} \cdot 362^\circ = x$ $\Rightarrow \frac{181\pi}{90} = x$	<b>(B)</b> $\frac{103\pi}{36}$



4.

<b>A</b>	$\frac{\pi}{180^\circ} = \frac{43\pi}{18x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{43\pi}{18}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{43\pi}{18} = x$ $\Rightarrow 430^\circ = x$	(C) 475°
<b>B</b>	$\frac{\pi}{180^\circ} = \frac{-97\pi}{36x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{-97\pi}{36}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-97\pi}{36} = x$ $\Rightarrow -485^\circ = x$	(E) 490°
<b>C</b>	$\frac{\pi}{180^\circ} = \frac{95\pi}{36x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{\frac{95\pi}{36}}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{95\pi}{36} = x$ $\Rightarrow 475^\circ = x$	(B) - 485°

<p><b>D</b></p>	$\frac{\pi}{180^\circ} = \frac{-83\pi}{x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{-83\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-83\pi}{36} = x$ $\Rightarrow -415^\circ = x$	<p>(F) <math>-412^\circ</math></p>
<p><b>E</b></p>	$\frac{\pi}{180^\circ} = \frac{49\pi}{x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{49\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{49\pi}{18} = x$ $\Rightarrow 490^\circ = x$	<p>(D) <math>-415^\circ</math></p>
<p><b>F</b></p>	$\frac{\pi}{180^\circ} = \frac{-103\pi}{x}$ $\Rightarrow \frac{180^\circ}{\pi} = \frac{x}{-103\pi}$ $\Rightarrow \frac{180^\circ}{\pi} \cdot \frac{-103\pi}{45} = x$ $\Rightarrow -412^\circ = x$	<p>(A) <math>430^\circ</math></p>