

## FA6 – Winkelfunktionen (Lösungen)

### Lösungen Maturaaufgaben:

- 1) Gehe zum Aufgabenpool Mathematik AHS: <https://prod.aufgabenpool.at/amn/index.php?id=M>
- 2) Gib im Feld „Volltextsuche“ die **Nummer** ein. Du kommst zur zugehörigen Aufgabe. Die Lösungen sind bei der Aufgabe enthalten.

Grundkompetenz	Aufgabentyp ▾	Schulstufe ▾	Volltextsuche
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Angestelltegehalt\* 1\_578, AN1.1, Offenes Antwortformat

  
**Nummer**

#### Bsp. 1)

a. $\alpha = 0,8^\circ$ $\varphi = \frac{\pi \cdot 0,8}{180^\circ}$ $\underline{\underline{\varphi \approx 0,014 \text{ rad}}}$	b. $\alpha = 22^\circ$ $\underline{\underline{\varphi \approx 0,38 \text{ rad}}}$	c. $\alpha = 49^\circ$ $\underline{\underline{\varphi \approx 0,86 \text{ rad}}}$	d. $\alpha = 99^\circ$ $\underline{\underline{\varphi \approx 1,73 \text{ rad}}}$
e. $\alpha = 134^\circ$ $\underline{\underline{\varphi \approx 2,34 \text{ rad}}}$	f. $\alpha = 200^\circ$ $\underline{\underline{\varphi \approx 3,49 \text{ rad}}}$	g. $\alpha = 300^\circ$ $\underline{\underline{\varphi \approx 5,24 \text{ rad}}}$	h. $\alpha = 359,5^\circ$ $\underline{\underline{\varphi \approx 6,27 \text{ rad}}}$

#### Bsp. 2)

a. $\varphi = 0,8 \text{ rad}$ $L = \frac{180 \cdot 0,8}{\pi}$ $\underline{\underline{L \approx 45,8^\circ}}$	b. $\varphi = 0,04 \text{ rad}$ $\underline{\underline{L \approx 2,29^\circ}}$	c. $\varphi = 6 \text{ rad}$ $\underline{\underline{L \approx 343,8^\circ}}$	d. $\varphi = 4 \text{ rad}$ $\underline{\underline{L \approx 229,2^\circ}}$
e. $\varphi = 3,3 \text{ rad}$ $\underline{\underline{L \approx 189^\circ}}$	f. $\varphi = 2,04 \text{ rad}$ $\underline{\underline{L \approx 116,9^\circ}}$	g. $\varphi = 0,005 \text{ rad}$ $\underline{\underline{L \approx 0,3^\circ}}$	h. $\varphi = 1,78 \text{ rad}$ $\underline{\underline{L \approx 101,99^\circ}}$

## Theorie

### Besondere Sinus-, Cosinus- und Tangenswerte

$\alpha$	$0^\circ$	$90^\circ$	$180^\circ$	$270^\circ$	$360^\circ$
$\sin \alpha$	0	1	0	-1	0
$\cos \alpha$	1	0	-1	0	1
$\tan \alpha$	0	/	0	/	0

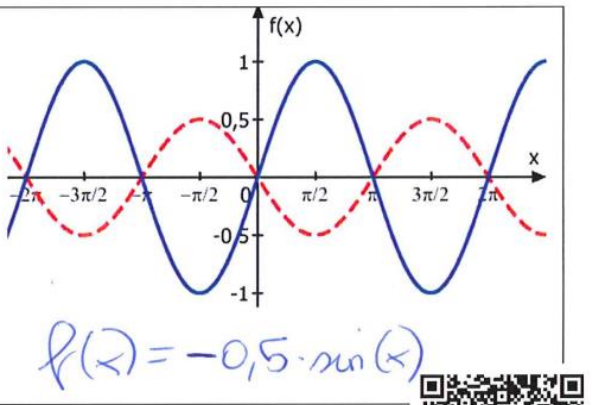
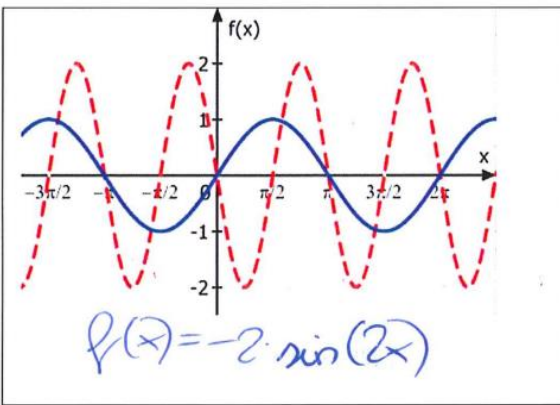
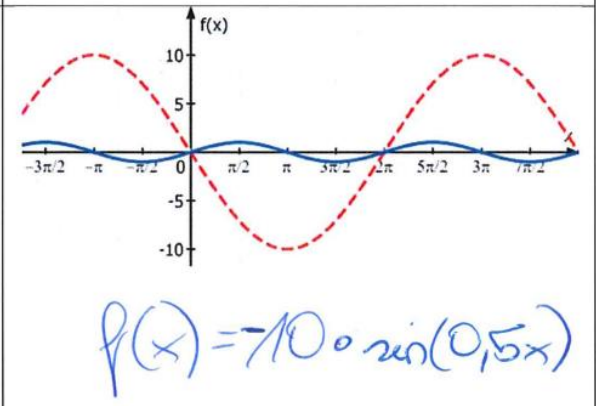
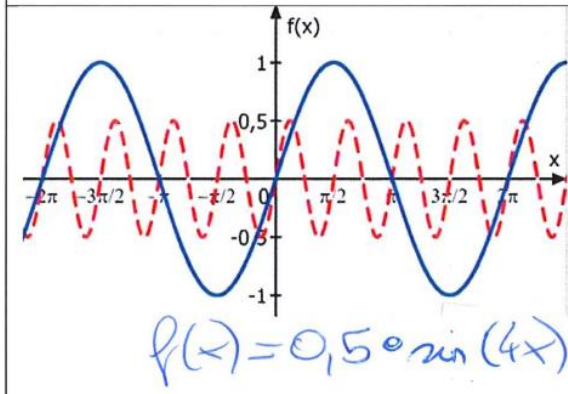
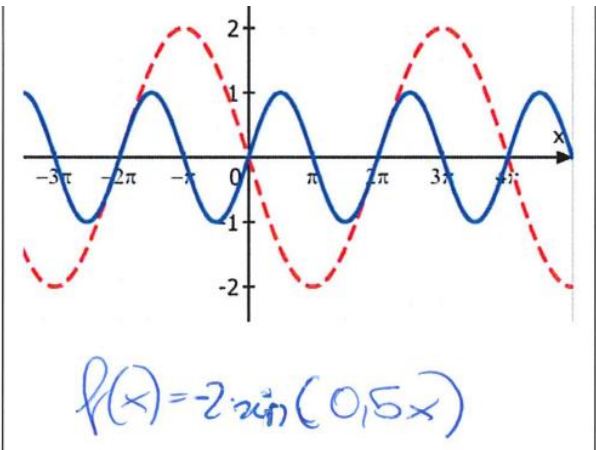
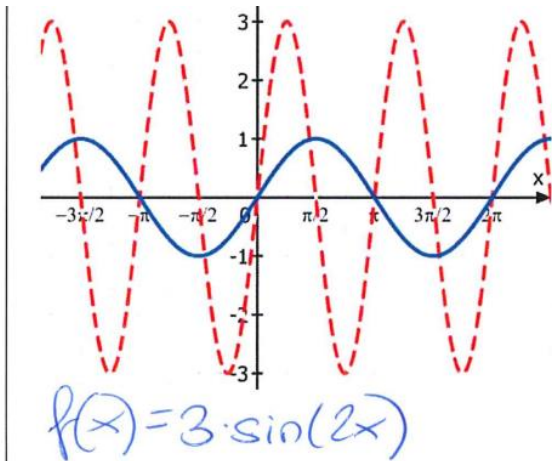
### Welchen Wertebereich nehmen Sinus, Cosinus und Tangens in den Quadranten an?

	1. Quadrant $0 < \alpha < 90^\circ$	2. Quadrant $90 < \alpha < 180^\circ$	3. Quadrant $180 < \alpha < 270^\circ$	4. Quadrant $270 < \alpha < 360^\circ$
$\sin \alpha$	$(0; 1)$	$(0; 1)$	$(-1; 0)$	$(-1; 0)$
$\cos \alpha$	$(0; 1)$	$(-1; 0)$	$(-1; 0)$	$(0; 1)$
$\tan \alpha$	$(0; +\infty)$	$(-\infty; 0)$	$(0; +\infty)$	$(-\infty; 0)$

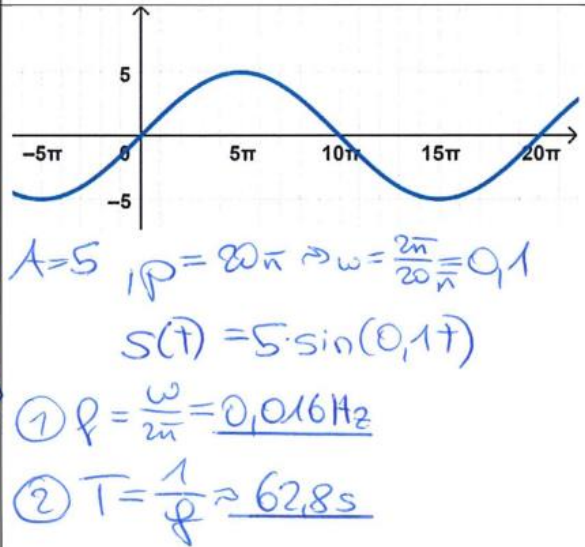
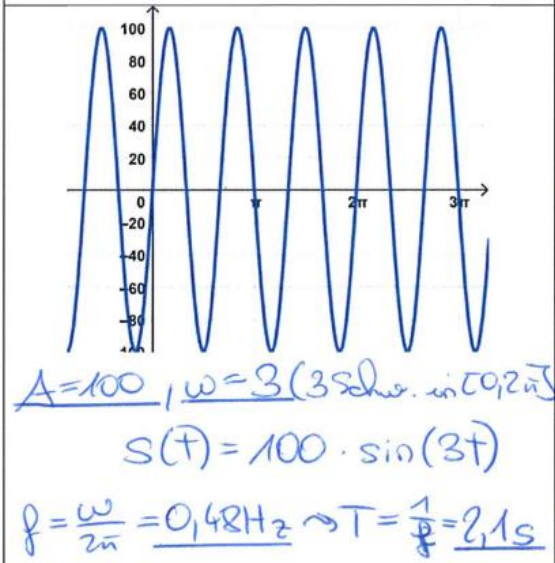
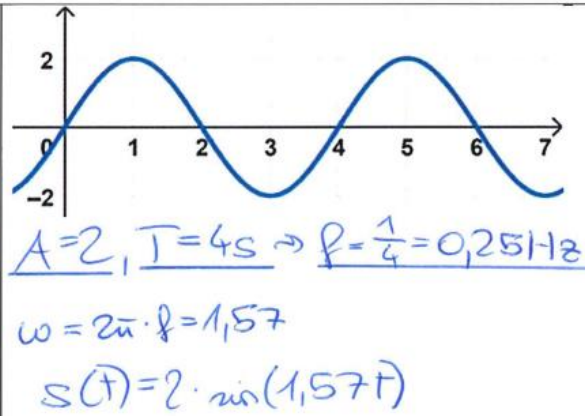
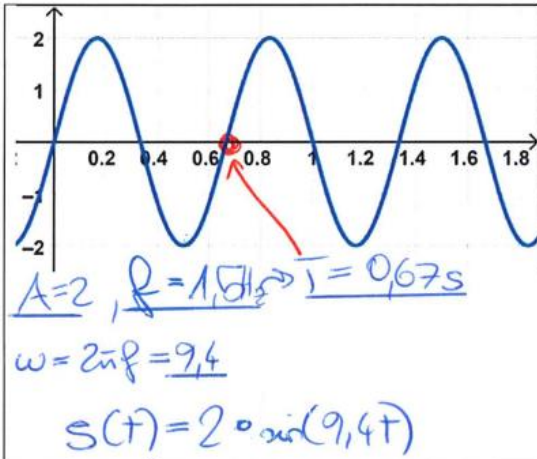
### Bsp. 3)

<p>a. <math>f(x) = \sin(3x)</math></p> <p><math>\circ D = \mathbb{R}, W = [-1; +1]</math></p> <p><math>\circ p = \frac{2\pi}{3}</math></p>	<p>b. <math>f(x) = 3 \cdot \cos(x)</math></p> <p><math>\circ D = \mathbb{R}, W = [-3; +3]</math></p> <p><math>\circ p = 2\pi</math></p>
<p>c. <math>f(x) = 2 \cdot \sin(4x)</math></p> <p><math>\circ D = \mathbb{R}, W = [-2; +2]</math></p> <p><math>\circ p = 0,5\pi</math></p>	<p>d. <math>f(x) = -2 \cdot \cos(2x)</math></p> <p><math>\circ D = \mathbb{R}, W = [-2; +2]</math></p> <p><math>\circ p = \pi</math></p>

Bsp. 4)



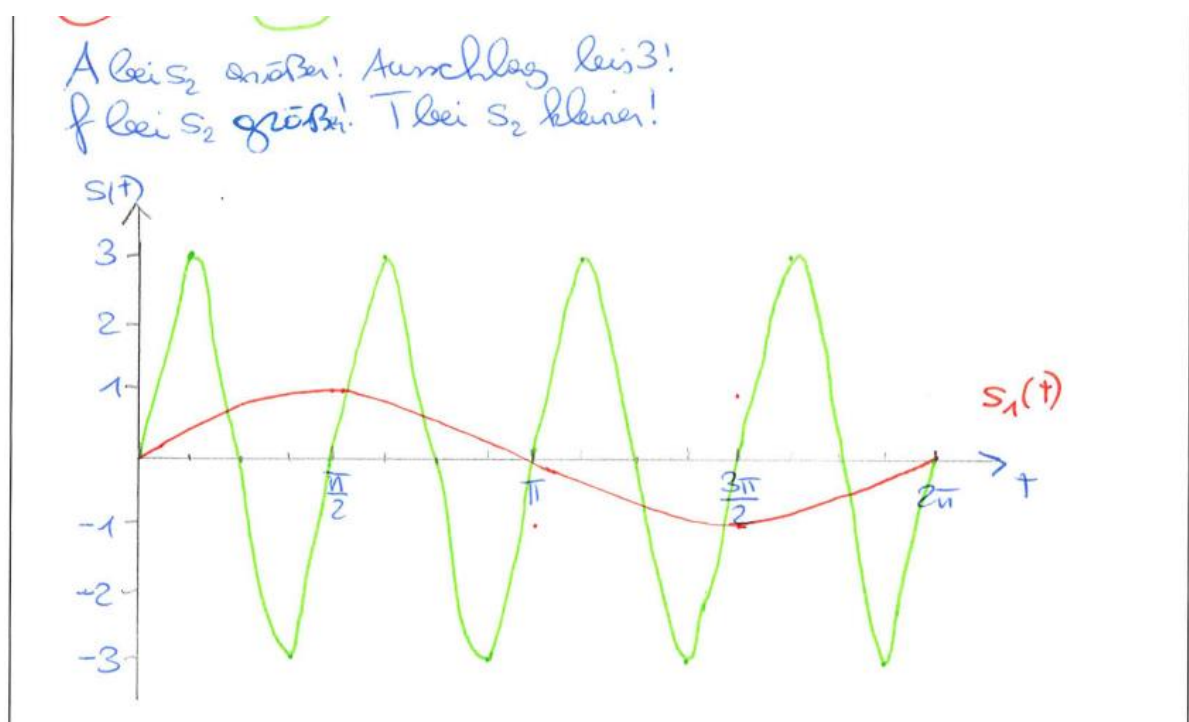
Bsp. 5)



Bsp. 6)

<p>a. <math>s(t) = 3 \cdot \sin(13t)</math></p> <p><math>A=3, \omega=13</math></p> <p>① <math>f = \frac{\omega}{2\pi} \approx \underline{2,07\text{Hz}}</math></p> <p>② <math>T = \frac{1}{f} \approx \underline{0,48\text{s}}</math></p>	<p>b. <math>s(t) = 8 \cdot \sin(5t)</math></p> <p><math>A=8, \omega=5</math></p> <p>① <math>f = \frac{\omega}{2\pi} \approx \underline{0,8\text{Hz}}</math></p> <p>② <math>T = \frac{1}{f} \approx \underline{1,26\text{s}}</math></p>
<p>c. <math>s(t) = 4 \cdot \sin(2 \cdot (t+2))</math></p> <p><math>A=4, \omega=2</math></p> <p>① <math>f = \frac{\omega}{2\pi} \approx \underline{0,32\text{Hz}}</math></p> <p>② <math>T = \frac{1}{f} \approx \underline{3,14\text{s}}</math></p>	<p>d. <math>s(t) = 1,5 \cdot \sin(3 \cdot (t-4))</math></p> <p><math>A=1,5, \omega=3</math></p> <p>① <math>f = \frac{\omega}{2\pi} \approx \underline{0,48\text{Hz}}</math></p> <p>② <math>T = \frac{1}{f} \approx \underline{2,09\text{s}}</math></p>

Bsp. 7)



- $A$  bei  $s_2$  kleiner (0,5)
- Frequenz bei  $s_2$  kleiner
- Schwingungsdauer bei  $s_2$  größer

