Trig Graphing – WS 1 Name Key

Part 2: Cosine Graphs with Dilations

Without graphing, describe in words the relationship between each pair of graphs. Include in you explanation differences you might notice in amplitude, period, reflection, etc. (Use appropriate vocabulary!)

12) $f(x)=\cos 2x$ and $g(x)=-\cos 2x$

Pos vs. neg reflects x-axis

13) $f(x)=\cos x$ and $g(x)=-5\cos x$

1 vs -5 Amp=5 Reflects x-axis

14) $f(x)=\cos x$ and $g(x)=\cos\left(\frac{x}{2}\right)$

$g(x)=\cos\left(\frac{x}{2}\right)$ 1 vs 1/2 $Pd=\frac{2\pi}{b}=\frac{2\pi}{1/2}=2\pi\cdot\frac{2}{1}=4\pi$

State the amplitude and period for each of the following functions. Then graph one complete period of each, remembering to label the tick divisions and both your horizontal axis and vertical axis. Also state the domain and range of one period using interval notation.

*** Remember: **θ → *degrees*** and **x → *radians***.

15) $y=-4\cos 3\theta$

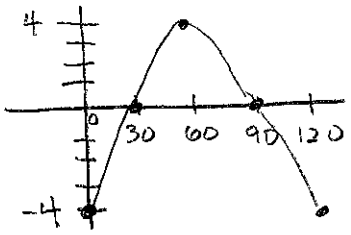
$3\theta=0$ $\theta=0°$ $3\theta=360°$ $\theta=120°$

A=4

$Pd=\frac{360}{3}=120°$

D=[0°, 120°]

R=[-4, 4]



16) $y=\frac{1}{2}\cos\frac{x}{4}$

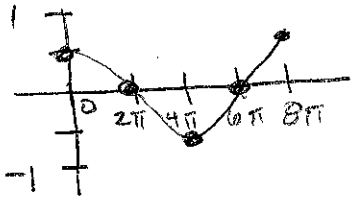
$\frac{x}{4}=0$ $x=0$ $\frac{x}{4}=2\pi$ $x=8\pi$

A=1/2

$Pd=\frac{2\pi}{1/4}=2\pi\cdot 4=8\pi$

D=[0, 8π]

R=[-1/2, 1/2]



17) $y=-3\cos\left(-\frac{1}{2}x\right)$

$\frac{1}{2}x=0$ $x=0$ $\frac{1}{2}x=2\pi$ $x=4\pi$

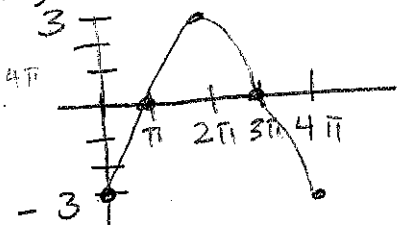
$y=-3\cos\left(\frac{1}{2}x\right)$

A=3

$Pd=\frac{2\pi}{1/2}=2\pi\cdot\frac{2}{1}=4\pi$

D=[0, 4π]

R=[-3, 3]



18) $y=\cos\left(-\frac{2}{3}x\right)$

$\frac{2}{3}x=0$ $x=0$ $\frac{3}{2}\cdot\frac{2}{3}x=2\pi\cdot\frac{3}{2}$ $x=3\pi$

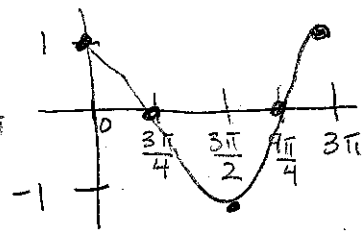
$y=\cos\left(\frac{2}{3}x\right)$

A=1

$Pd=\frac{2\pi}{2/3}=2\pi\cdot\frac{3}{2}=3\pi$

D=[0, 3π]

R=[-1, 1]



19) $y=\cos 2\pi x$

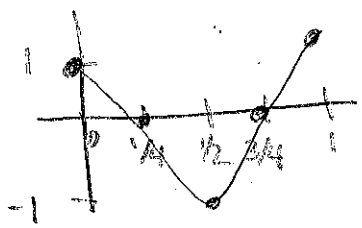
$2\pi x=0$ $x=0$ $2\pi x=2\pi$ $x=1$

A=1

$Pd=\frac{2\pi}{2\pi}=1$

D=[0, 1]

R=[-1, 1]



20) $y=-10\cos\left(\frac{\pi}{5}x\right)$

$\frac{\pi}{5}x=0$ $x=0$ $\frac{\pi}{5}x=2\pi\cdot\frac{5}{\pi}$ $x=10$

A=10

$Pd=\frac{2\pi}{\pi/5}=2\pi\cdot\frac{5}{\pi}=10$

D=[0, 10]

R=[-10, 10]