Test: Tomorrow

ex. $f(x)=\sqrt{3x-4}$ & $g(x)=\sqrt{x^2+x-20}$

1) Find the domain of $(f \circ g)(x)$ $\quad f(g(x))$

2) Find the range of $g^{-1}(x)$

3) Find $(f+g)(5)$

$f(x)=\sqrt{\boxed{3x-4}}$

Domain:

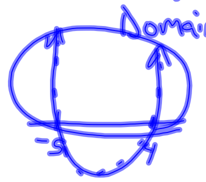
$3x-4 \geq 0$

$3x \geq 4$

$x \geq \frac{4}{3}$

$g(x)=\sqrt{x^2+x-20}$ Above x-axis

Domain: $x^2+x-20 \geq 0$

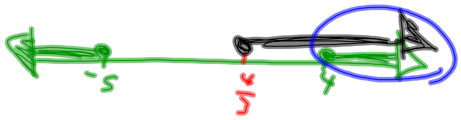


$(x+5)(x-4)=0$

$x=-5, 4$

$x \leq -5$ or $x \geq 4$

Domain of $(f \circ g)(x)$ . . . *Intersect Domains



D: $\{x \mid x \geq 4, x \in \mathbb{R}\}$

2) Range of $g^{-1}(x)$ is Domain of $g(x)$

Range: $\{y \mid y \leq -5$ or $y \geq 4, y \in \mathbb{R}\}$

3) $(f+g)(x)$ $\quad (fg)(x)$ $\quad (f \circ g)(x)$

$(f-g)(x)$ $\quad f(x)\,g(x)$ $\quad f(g(x))$

$\left(\frac{f}{g}\right)(x)$

$(f+g)(5)$

$f(5)+g(5)$

$\sqrt{3(5)-4}+\sqrt{(5)^2+(5)-20}$

$\sqrt{11}+\sqrt{10}$

$f(x) = 2x - 4 \qquad g(x) = x^2 + 1 \qquad h(x) = \sqrt{x+9}$

ex 1) $f[g(-5)] \Rightarrow g(-5) = (-5)^2 + 1$

$= 26$

$f(26) = 2(26) - 4$

$= \underline{48}$

2) $g[f(h(7))] = \underline{\underline{17}}$

3) $g[h(3w)] - (g - f)(3w+1)$

$h(3w) = \sqrt{3w+9}$

$g(\sqrt{3w+9}) = (\sqrt{3w+9})^2 + 1$

$= 3w + 9 + 1$

$= 3w + 10$

$(g-f)(3w+1)$

$g(3w+1) - f(3w+1)$

$(3w+1)^2 + 1 \qquad 2(3w+1) - 4$

$9w^2 + 6w + 1 + 1 \qquad 6w + 2 - 4$

$(9w^2 + 6w + 2) - (6w - 2)$

$(9w^2 + 4)$

$= (3w+10) - (9w^2+4)$

$\boxed{= -9w^2 + 3w + 6}$

Convert each of the following angles from radians to degrees.

a) $\frac{\pi}{2}$ radians b) $\frac{3\pi}{4}$ radians c) π radians d) $\frac{\pi}{6}$ radians

e) 5π radians f) $\frac{4\pi}{5}$ radians g) $\frac{7\pi}{4}$ radians h) $\frac{\pi}{10}$ radians

$\boxed{\pi \text{ Rad} = 180°}$

f) $\frac{4\pi}{5}$

$\frac{4(180°)}{5}$

$= \underline{144°}$

g) $\frac{180°}{10}$

$= \underline{18°}$

Convert each of the following angles from degrees to radians giving your answer to 2 decimal places.

a) 17^o b) 49^o c) 124^o d) 200^o

c) $\frac{124\pi}{180}$

$= \frac{31\pi}{45}$

$= 2.2$ Rad

d) $\frac{200\pi}{180} = \frac{10\pi}{9}$

$= 3.5$ Rad

Convert each of the following angles from radians to degrees, giving your answer to 1 decimal place.

a) 0.6 radians b) 2.1 radians c) 3.14 radians d) 1 radian

$0.6 \text{ Rad} \times \dfrac{180^\circ}{\pi \text{ Rad}}$

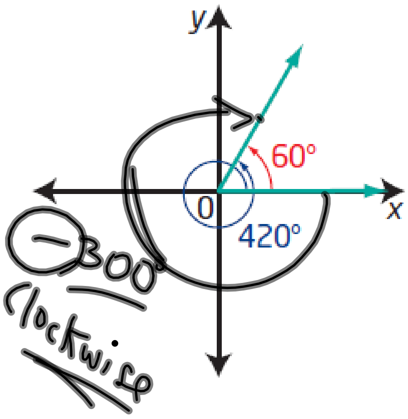
$= 34.4^\circ$

$2.1 \text{ Rad} \times \dfrac{180^\circ}{\pi \text{ Rad}}$

$= 120.3^\circ$

Coterminal Angles

When you sketch an angle of 60° and an angle of 420° in standard position, the terminal arms coincide. These are **coterminal angles**.



coterminal angles

- angles in standard position with the same terminal arms
- may be measured in degrees or radians
- $\frac{\pi}{4}$ and $\frac{9\pi}{4}$ are coterminal angles, as are 40° and −320°

$2\pi = 360°$

Strategy for finding coterminal angles in either radians or degrees?

$\theta \pm 360°k,\ k \in N$ (Degrees)

or

$\theta + 360°k,\ k \in I$

$$\left.\begin{matrix} \theta \pm 2\pi k,\ k \in N \\ \text{or} \\ \theta + 2\pi k,\ k \in I \end{matrix}\right\} \text{Radians}$$

For each angle in standard position, determine one positive and one negative angle measure that is coterminal with it.

a) $270°$ **b)** $-\frac{5\pi}{4}$ **c)** $740°$

a) $270° + 360°$
$= 630°$

$270° - 360°$
$= -90°$

b) $-\frac{5\pi}{4} + \frac{2\pi}{1}$
$= \frac{3\pi}{4}$

$= -\frac{5\pi}{4} - \frac{2\pi}{1}$
$= -\frac{13\pi}{4}$

c) $740° + 360°$
$= 1100°$

$740° - 360°$
$= 380°$

$380° - 360°$
$= 20°$

$20° - 360° = -340°$

$17482°$
$\div 360°$
48 full Rev

$17482° - 49(360°)$