

Ex 7.2

7. $\sin \frac{A}{2}$, if $\cos A = \frac{2}{3}$ and A is in quadrant 4.

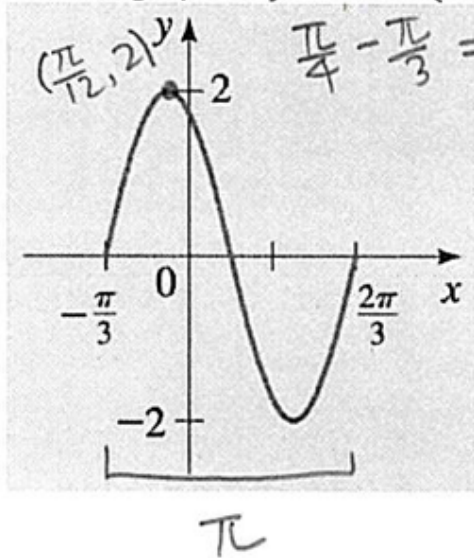
$$= \pm \sqrt{\frac{1 - \cos A}{2}} = \pm \sqrt{\frac{1 - \frac{2}{3}}{2}} = \pm \sqrt{\frac{1}{6}}$$

Q4

① $270 - 360 \rightarrow 135 - 180 \rightarrow \oplus$

② $630 - 720 \rightarrow 315 - 360 \rightarrow \ominus$

12. The graph of $y = A \cos(Bx + C)$ shown below. Find A, B, and C.



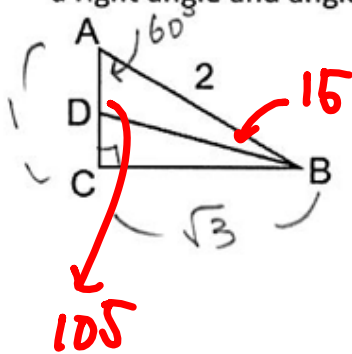
$$y = 2 \cos\left(2\left(x + \frac{\pi}{12}\right)\right)$$

$$A = 2$$

$$B = 2$$

$$C = +\frac{\pi}{6}$$

11. In Right triangle ABC with hypotenuse of AB, an angle bisector, BD, is drawn. If angle C is a right angle and angle A measures 60° , find the length of AD.



$$AD = AC - CD$$

$$= 1 - \frac{3\sqrt{2} - \sqrt{6}}{\sqrt{6} + \sqrt{2}}$$

$$\tan 15^\circ = \frac{CD}{\sqrt{3}} = \frac{\sqrt{6} - \sqrt{2}}{\sqrt{6} + \sqrt{2}}$$

$$CD = \frac{3\sqrt{2} - \sqrt{6}}{\sqrt{6} + \sqrt{2}}$$

$$\frac{2}{\sin 105^\circ} = \frac{x}{\sin 15^\circ}$$

$$\frac{\sqrt{6} - \sqrt{2}}{2} = x \left(\frac{\sqrt{6} + \sqrt{2}}{4} \right)$$

$$\frac{2(\sqrt{6} - \sqrt{2})}{\sqrt{6} + \sqrt{2}}$$

13. Find all solutions for
 $\cos 3x + \cos x = 0$

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

$$= 2 \cos(2x) \cos(x) = 0$$

$$\rightarrow 2x = \frac{\pi}{2} + \pi k$$

$$x = \frac{\pi}{2} + \pi k$$

$$\rightarrow x = \frac{\pi}{4} + \frac{\pi}{2} k$$

Let $f(x) = \sqrt{4-x}$ and $g(x) = x^2 + 2x$.

4. Find domain of

a. $f+g$

$$D: x \leq 4 \rightarrow D_f \cap D_g$$

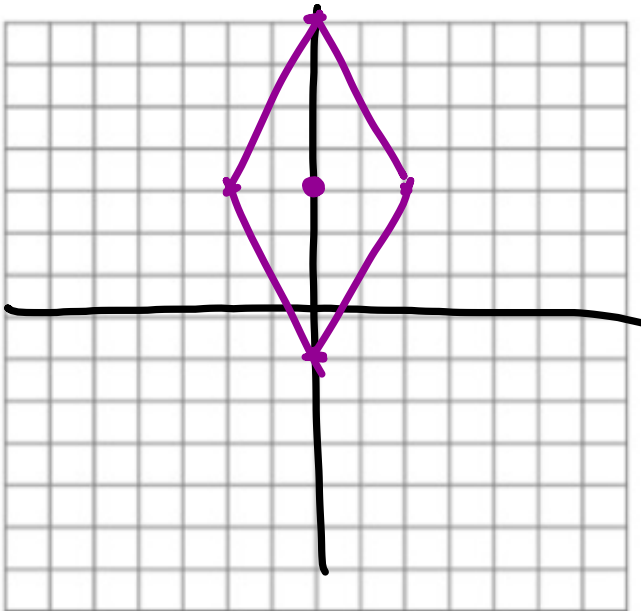
b. f/g

$$(x \leq 4) \cap (x \neq -2, 0) \rightarrow D_f \cap D_g \cap g \neq 0$$

2. For every real number x , $[x]$ denotes the greatest integer less than or equal to x . Find all values of x in the interval $2 \leq x < 5$ that satisfy $[x]^2 = [x^2]$.

$$\begin{array}{l}
 [x]^2 = 2^2 = 4 = [k] \quad 4 \leq k < 5 \\
 2 \leq x < 3 \quad 3^2 = 9 \quad \boxed{2 \leq x < \sqrt{5}} \\
 3 \leq x < 4 \quad 4^2 = 16 \quad \begin{array}{l} 9 \leq k < 10 \\ \boxed{3 \leq x < \sqrt{10}} \end{array} \\
 4 \leq x < 5 \quad \quad \quad \begin{array}{l} \boxed{4 \leq x < \sqrt{17}} \end{array}
 \end{array}$$

7. Find the area enclosed by the graph of ~~$|x| + |y + 2| = 4$~~ .
(Sketch is optional)



$$2|x| + |y - 3| = 4$$

$$\underline{A = 16}$$

8. Let $x + \frac{1}{x} = 3$. What is the value of $x^3 + \frac{1}{x^3}$?

$$\begin{aligned} & \left(x + \frac{1}{x}\right) \left(x^2 - 1 + \frac{1}{x^2}\right) \\ &= \left(x + \frac{1}{x}\right) \left(\left(x + \frac{1}{x}\right)^2 - 3\right) \\ & 3(9-3) = 18 \end{aligned}$$