

Solutions Gateway 07-08

① Domain $\sqrt{2x+3}$

$$2x+3 \geq 0$$

$$2x \geq -3$$

$$x \geq -\frac{3}{2}$$

② $(-5, 0)$ $(0, 0)$ $(5, 0)$

$$(x-5)(x+5)x = \boxed{x^3 - 25x = f(x)}$$

or $y=0$ (x-axis)

③ $f = x^4 - 3x^2 + 2$ $(x^2 - 1)(x^2 - 2)$

a) $\frac{y\text{-intercept}}{(0, 2)}$ $\frac{x\text{-int}}{(-1, 0), (1, 0), (\sqrt{2}, 0), (-\sqrt{2}, 0)}$ $(x+1)(x-1)(x+\sqrt{2})(x-\sqrt{2})$

b) $(-x)^4 - 3(-x)^2 + 2 = x^4 - 3x^2 + 2$
 $f(-x) = f(x)$

④ Not even

even

Is it odd? $-f(x) = f(-x)$?

$$\begin{aligned} (-x)^2 + (-x)y + y^2 &= -x^2 + x(-y) + (-y)^2 \\ x^2 - xy + y^2 &\neq -x^2 - xy + y^2 \end{aligned}$$

Neither Not odd

⑤

$$x^2 - 2x - y = 6$$

$$x - y = -4$$

$$x^2 - 2x - (x + 4) = 6$$

$$x + 4 = y$$

$$x^2 - 3x - 10 = 0$$

$$(x + 2)(x - 5) = 0$$

$$x = -2, 5$$

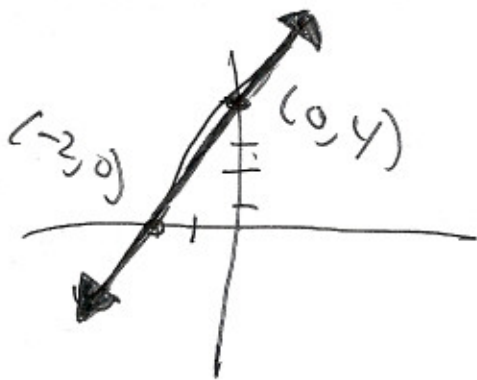
$$y(-2) = -2 + 4 = 2$$

$$\begin{matrix} (-2, 2) \\ (5, 9) \end{matrix}$$

$$y(5) = 5 + 4 = 9$$

⑥

$$4x - 2y + 8 = 0$$

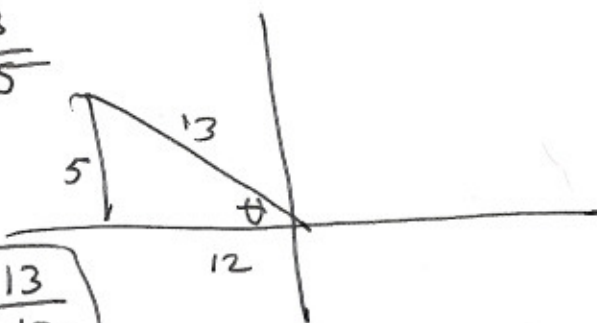


7 Trig solutions B

$$\csc \theta = \frac{13}{5}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$= \boxed{\frac{-13}{12}}$$



8

$$\sqrt{x^2 + 4}$$

$$x = 2 \tan \theta$$

$$\sqrt{4 \tan^2 \theta + 4}$$

$$= 2 \sqrt{\tan^2 \theta + 1}$$

$$= \boxed{2 \sec \theta}$$

9

$$\frac{\cot \theta}{\csc \theta} =$$

$$\frac{\cos \theta}{\sin \theta}$$

$$\frac{\sin \theta}{1/\sin \theta}$$

$$= \boxed{\cos \theta}$$

10

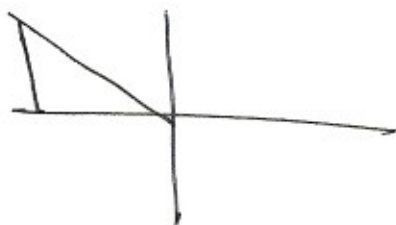
$$\tan \theta (2 \cos \theta + 1) = 0$$

$$\tan \theta = 0$$

$$2 \cos \theta = -1$$

$$\boxed{\theta = 0, \pi}$$

$$\cos \theta = -\frac{1}{2}$$



$$\boxed{\frac{2\pi}{3}, \frac{4\pi}{3}}$$

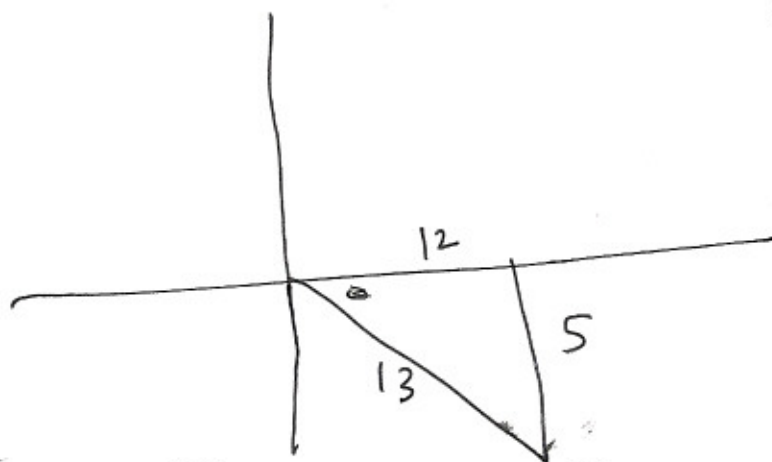
Trig Solutions A

⑦ $\cos \theta = \frac{12}{13}$

$\csc \theta = \frac{1}{\sin \theta}$

$= \frac{1}{\frac{5}{13}}$

$= \frac{13}{5}$



⑧

$\sqrt{x^2 - 9}$

$x = 3 \sec \theta$

$= \sqrt{9 \sec^2 \theta - 9} = 3 \sqrt{\sec^2 \theta - 1}$

$= 3 \tan \theta$

⑨

$\frac{\cot \theta}{\csc \theta}$

$= \frac{\cos \theta}{\frac{1}{\sin \theta}}$

$= \cos \theta$

⑩

$\cos \theta (\tan \theta + \sqrt{3}) = 0$

$\cos \theta = 0$

$\frac{\pi}{2}, \frac{3\pi}{2}$

$\tan \theta = -\sqrt{3}$

$\frac{2\pi}{3}, \frac{5\pi}{3}$

