SARALA BIRLA PUBLIC SCHOOL
(SARALA BIRLA GROUP OF SCHOOLS)

SARALA BIRLA PUBLIC SCHOOL

Birla Knowledge City, Mahilong, Ranchi

CLASS XII, (2020-21)

Sub: Mathematics

Assignment-5

1. The principal value of $\sin^{-1}\left(\sin\frac{2\pi}{3}\right)$ is

a) $\frac{2\pi}{3}$ ***b)*** $\frac{\pi}{3}$ ***c)*** $\frac{4\pi}{3}$ ***d)*** None of these

2. The principal value of $\cos^{-1}\left\{\frac{1}{\sqrt{2}}\left(\cos\frac{9\pi}{10}-\sin\frac{9\pi}{10}\right)\right\}$ is

a) $\frac{3\pi}{10}$ ***b)*** $\frac{17\pi}{20}$ ***c)*** $\frac{9\pi}{20}$ ***d)*** None of these

3. Let $f:R\to R$ and $g:R\to R$ be two functions such that $fog(x)=\sin x^2$ and $gof(x)=\sin^2 x$, then $f(x)$ and $g(x)$ are

a) $f(x)=x^2$ and $g(x)=\sin x$ ***b)*** $f(x)=\sin x$ and $g(x)=x^2$

c) $f(x)=\sin^2 x$ and $g(x)=\sqrt{x}$ ***d)*** $f(x)=\sin x$ and $g(x)=\sqrt{x}$

4. The principal value of $\sin^{-1}\left\{\cos\left(\sin^{-1}\frac{\sqrt{3}}{2}\right)\right\}$ is

a) $\frac{\pi}{6}$ ***b)*** $\frac{\pi}{3}$ ***c)*** $-\frac{\pi}{3}$ ***d)*** None of these

5. Let $f:R\to R$ and $g:R\to R$ be two functions such that $f(x)=2x-3$ and $g(x)=x^3+5$, then $(fog)^{-1}(x)$ is equal to

a) $\left(\frac{x+7}{2}\right)^{1/3}$ ***b)*** $\left(x-\frac{7}{2}\right)^{1/3}$ ***c)*** $\left(\frac{x-2}{7}\right)^{1/3}$ ***d)*** $\left(\frac{x-7}{2}\right)^{1/3}$

6. Let $f:R\to R$ and $g:R\to R$ defined by $f(x)=x+2$ and $g(x)=2-x$, then $(fog)(3)$ is equal to

a) 1 ***b)*** 2 ***c)*** 3 ***d)*** None of these

7. The inverse of the function $f(x)=3x-5,\quad x\in R$ is

a) $\frac{1}{3x-5}$ ***b)*** $\frac{x+5}{3}$ ***c)*** $\frac{1}{3x+5}$ ***d)*** $\frac{1}{5x-3}$

8. Let $f:N\to R:\ f(x)=\frac{2x-3}{2}$ and $g:Q\to R:\ g(x)=x+2$ be two functions, then $(fog)\left(\frac{3}{2}\right)$ is

a) 3 ***b)*** 1 ***c)*** $\frac{7}{2}$ ***d)*** None of these

9. Which of the following is the principal value branch of $\cos^{-1}x$?

a) $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$ ***b)*** $(0,\pi)$ ***c)*** $[0,\pi]$ ***d)*** $(0,\pi)-\left\{\frac{\pi}{2}\right\}$

10. Which of the following is the principal value branch of $\cos ec^{-1}x$?

a) $\left(-\frac{\pi}{2},\frac{\pi}{2}\right)$ ***b)*** $(0,\pi)-\left\{\frac{\pi}{2}\right\}$ ***c)*** $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$ ***d)*** $\left[-\frac{\pi}{2},\frac{\pi}{2}\right]-\{0\}$

11. If $f:[0,\infty)\to[0,\infty)$ and $f(x)=\frac{x}{x+1}$, then f in R is

a) one-one and onto ***b)*** one-one but not onto

c) onto but not one-one ***d)*** neither one-one nor onto

12. Let $f:R\to R$ be a function defined by $f(x)=x^3+4$, then f is

a) injective ***b)*** surjective

c) bijective ***d)*** None of these

13. The function $f:N\to N$, where N is the set of natural number defined by $f(x)=7x+11 \quad \forall \quad x\in N$ is

a) injective ***b)*** surjective

c) bijective ***d)*** None of these

14. Let N be the set of natural number and the function $f:N\to N$ defined by $f(x)=2x+3 \quad \forall \quad x\in N$, then f is :

a) injective ***b)*** surjective

c) bijective ***d)*** None of these

15. The function $f:N\to N$, where N is the set of natural number defined by $f(x)=6+5x$ is :

a) injective ***b)*** surjective

c) bijective ***d)*** None of these

16. ***If*** $f(x)=\frac{x^2-4}{x^2+4}$ for $|x|\geq 2$, then the $f:(-\infty,-2)\cup[2,\infty)\to(-1,1)$ is

a) one-one and into ***b)*** one-one and onto

c) onto but not one-one ***d)*** many-one and into

17. A function f from the set of natural number to integer

$$f(x)=\begin{cases}\frac{n-1}{2} & , \quad \textit{when n is odd}\\ -\frac{n}{2} & , \quad \textit{when n is even}\end{cases}$$ is

a) one-one but not onto ***b)*** onto but not one-one

c) one-one and onto both ***d)*** neither one-one nor onto

18. For all real x, let $f(x)=x^3+5x+1$, then

a) one-one and onto ***b)*** onto but not one-one

c) one-one and onto both ***d)*** neither one-one nor onto

19. If $\sin^{-1}x=y$, then

a) $0\leq y\leq\pi$ ***b)*** $-\frac{\pi}{2}\leq y\leq\frac{\pi}{2}$ ***c)*** $0<y<\pi$ ***d)*** $-\frac{\pi}{2}<y<\frac{\pi}{2}$

20. If $\sin^{-1}\left(\frac{3x}{5}\right)+\sin^{-1}\left(\frac{4x}{5}\right)=\sin^{-1}x$, then the value x is

a) 0, 1 ***b)*** 0, -1 ***c)*** 1, -1 ***d)*** 0, 1, -1

Activity I

To verify that the relation R in the set L of all lines in a plane, defined by $R = \{(l , m) : \quad l \perp m\}$ is symmetric but neither reflexive nor transitive.