ANSWER KEYS 3. (2) 4. (1) 5. (1) 6 6. (1) 7. (4) 8. (3) mathon **2.** (4) **9.** (4) **10.** (4) ///. mathongo ///. matlWe have, ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. $|x-1| \ge |x-3|$ Mathongo Mat $\left(x-1\right)^2 \geq \left(x-3\right)^2$ $\Rightarrow x^2 - 2x + 1 \ge x^2 - 6x + 9$ hongo // mathongo // $\Rightarrow 4x \geq 8$ /// mathongo // mathongo /// mathongo /// mathongo // matho 2. (4) athongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// mathum $\left|\frac{x^2+6}{5x}\right| \geq 1$ ". mathum math Now, we know that if $|x| \ge a \Rightarrow x \le -a$ or $x \ge a$. /// mat Therefore, first we will solve for mathongo /// mathongo /// mathongo /// mathongo /// mathongo /// $\frac{x^2+6}{5x} \geq 1$ ///. math $\Rightarrow \frac{x^2+6-5x}{5x} \geq 0$ athongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mathongo ///. mat From the wavy curve, we have mathongo mathon ///. mathongo ///. ngathongo ///. 21athongo 3//. mathongo ///. mathongo ///. mathongo ///. mathongo ///. $x \in (0,2] \cup [3,\infty) \ldots (i)$ mathongo we mathon we will be also we will be a superior with the mathon will be a superior with the mathon we will be a superior with the mathon will be a superior with the mathon will be a superior with the superior will be a superior will be a $\frac{x^2+6}{5x} \leq -1$ $\Rightarrow \frac{x^2+6+5x}{5x} \leq 0$ $\Rightarrow \frac{(x+2)(x+3)}{5x} \leq 0$ $\Rightarrow \frac{(x+2)(x+3)}{5x} \leq 0$ $\Rightarrow \frac{(x+3)(x+3)}{5x} \leq 0$ ///. mathor(yo | ///. mluthongo | ///. mluthongo | ///. mathongo | ///. matho mathonge /// math Combining (i) and (ii), we get $\text{math}(-\infty, -3] \cup [-2, 0) \cup (0, 2] \cup [3, \infty).$

Answer Keys and Solutions

3. $\log_2(x^2+3x) \ge 0$					
$(2) \Rightarrow 2 \ge \log_2 \left(x^2 + 3x \right)$					
$\Rightarrow x^2 + 3x - 4 \le 0$ $\Rightarrow (x+4)(x-1) \le 0$					
///. mathango 1///. mathongo ///.					
$x\in (-4,1]$ (i)					
Also $x^2 + 3x > 0$ mathongo ///.					
$\Rightarrow x(x+3)>0$					
///. mathenge /// mathonge ///.					
$\Rightarrow x \in (-\infty, -3) \cup (0, \infty) \dots (ii)$					
Combining equations (1) and (2) $x \in (-4, -3) \cup (0, 1]$					
Hence, (B) is correct. 4. (1) Here, it is given that					
4. (1) Here, it is given that $(r^2 + r^2)^{-1}$					
$egin{align} rac{\log_2\left(x^2-5x+4 ight)}{\log_2\left(x^2+1 ight)} > 1 \ x^2-5x+4 > 0 \Rightarrow & (x-4)(x-1) > 0 \end{cases}$					
$\Rightarrow x \in (-\infty,1) \cup (4,\infty) \qquad \ldots (1)$ $x^2+1>0$ which is true $orall x \in R$.	(2)				
$\log_2(x^2-5x+4)\!>\log_2(x^2+1)$					
$x^2 - 5x + 4 > x^2 + 1$					
-5x + 3 > 0					
$x < \frac{3}{5}$ on (3) // mathongo ///					
From equations, (1) , (2) and (3) we get					
$x \in \left(-\infty, \frac{3}{5}\right) - \{0\}$					
5. (1) $\log_{0.2} \frac{x+2}{x} \le 1$					
$\Rightarrow \frac{x+2}{x} \geq 0.2$ mathongo ///. $\frac{5(x+2)-x}{x} \geq 0$					
$\Rightarrow \frac{\overset{4}{4}x+10}{x} \geq 0 \qquad \text{mathongo} \qquad \text{"}$					
///. mathongo ///. mathongo ///.					
$x \in \left(-\infty, -\frac{5}{2}\right) \cup \left(0, \infty\right)$					
$x \in \left(-\infty, -\frac{5}{2}\right) \cup (0, \infty)$ Hence, (A) is correct.					
/// mathongo /// mathongo ///.					

Answer Keys and Solutions

6. (1) $x - \sqrt{1 - x } < 0$ othongo ///					
Firstly $ x \leq 1 \Rightarrow x \in [-1,1]$					
If $x \in [-1,0]$, inequality will always ho If $x \leq [0,1]$	ld true. ongo				
$x < \sqrt{1 - x }$ Squaring, we get					
$x^{2} \leq 1 - x$ $\Rightarrow x^{2} + x - 1 < 0 \text{mathongo} ///$					
math2ngo $\frac{-1-\sqrt{5}}{2}$ mathongo ///.					
$\Rightarrow x \in \left(0, -1 + \frac{\sqrt{5}}{2}\right)$					
Hence, (A) is correct. 7. (4) Given $f(x) = [x]$ and $g(x) = x $					
Now, $f\!\left(g\!\left(\frac{8}{5}\right)\right) = f\!\left(\frac{8}{5}\right) = \left[\frac{8}{5}\right] = 1$					
And $g\left(f\left(-\frac{8}{5}\right)\right) = g\left(\left[-\frac{8}{5}\right]\right) = g(-2) =$	mathongo = 2				
$\therefore f\!\left(g\!\left(\frac{8}{5}\right)\right)\!-\!g\!\left(f\!\left(-\frac{8}{5}\right)\right)\!=1-2=$	mathongo –1				
8. (3) athongo /// mathongo ///					
We have, $y = 3[x] + 1 = 4[x - 1] - 10$					
$y = 3[x] + 1 = 4[x] - 14; \ (\because [X]$					
		mathongo			
[x + 2y] = [x] + 2y = 15 + 92					
= 107 ///. mathongo ///.					
9. (4)					
Given, $[x]^2 - 5[x] + 6 = 0$					
$\Rightarrow \left[x ight]^2 - 3[x] - 2[x] + 6 = 0$					
(Using middle term factorisation) $\Rightarrow [x]([x]-3)-2([x]-3)=0$	mathongo				
$\Rightarrow [x]([x] 0) 2([x] 0) = 0$ $\Rightarrow ([x]-3)([x]-2)=0 \text{ ngg}$ $\Rightarrow [x]=3 \text{ or } [x]=2$					

Basics

Answer Keys and Solutions

10. (4) athongo ///. mathon		
We know that,		
$\{x\}+\{-x\}=0; x\in I$ $\& \{x\}+\{-x\}=1; ext{ other}$ $\therefore y=0 \ orall \ x\in I ext{ and } y=1$		
mat For $x \in [-1, 2]$ athon $y = 0$ at $x = -1, 0, 1,$		
$y=1\ orall\ x\in[-1,\ 2]-\{$		