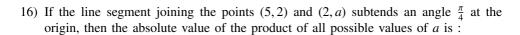
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a) 4

b) 2

c) 6

d) 8

17) If the shortest distance between the lines
$$\frac{x-\lambda}{2} = \frac{y-4}{3} = \frac{z-3}{4}$$
 and $\frac{x-2}{4} = \frac{y-4}{6} = \frac{z-7}{8}$ is $\frac{13}{\sqrt{29}}$, then the value of λ is:

a) -1

b) 1

c) $\frac{13}{25}$

d) $-\frac{13}{25}$

a) 175

b) 179

c) 181

d) 177

19) if
$$\alpha \neq a, \beta \neq b, \gamma \neq c$$
 and $\begin{vmatrix} \alpha & b & c \\ a & \beta & c \\ a & b & \gamma \end{vmatrix} = 0$, then $\frac{a}{\alpha - a} + \frac{b}{\beta - b} + \frac{\gamma}{\gamma - c}$ is equal to:

a) 2

b) 3

c) 0

20) For
$$a, b > 0$$
, let $f(x) = \begin{cases} \frac{\tan((a+1)x) + b \tan x}{x} & , x < 0; \\ 3 & , x = 0; \text{ be a continuous function at } x = 0. \\ \frac{\sqrt{ax + b^2 x^2} - \sqrt{ax}}{b \sqrt{ax} \sqrt{x}} & , x > 0; \end{cases}$

Then $\frac{b}{a}$ is equal to :

a) 5

b) 4

c) 6 d) 8

- 21) Let a ray of light passing through the point (3, 10) reflects on the line 2x + y = 6 and then reflected ray passes through the point (7, 2). If the equation of the incident ray is ax + by + 1 = 0, then $a^2 + b^2 + 3ab$ is equal to _____.
- 22) Let $\alpha |x| = |y| e^{xy-\beta}$, $\alpha, \beta \in \mathbb{N}$ be the solution of the differential equation xdy ydx + xy(xdy + ydx) = 0, y(1) = 2. Then $\alpha + \beta$ is equal to _____.
- 23) Let $a,b,c \in \mathbb{N}$ and a < b < c. Let the mean, the mean deviation about the mean and the variance of the 5 observations 9,25,a,b,c be 18, 4 and $\frac{136}{5}$, respectively. Then 2a+b-c is equal to
- 24) Let S be the focus of the hyperbola $\frac{x^2}{3} \frac{y^2}{5} = 1$, on the positive x-axis. Let C be the circle its centre at $A(\sqrt{6}, \sqrt{5})$ and passing through the points S. If O is the origin and SAB is a diameter of C, then the square of the area of the triangle OSB is equal to .
- 25) Let \overline{A} be the region enclosed by the parabola $y^2 = 2x$ and the line x = 24. Then the maximum area of the rectangle inscribed in the region A is:
- 26) An arithmetic progression is written in the following way

20		23		26		29
	11		14		17	
		5		8		
			_			

The sum of all the terms in 10th row is .

- 27) The number of distinct real roots of the equation |x + 1||x + 3| 4|x + 2| + 5 = 0 is
- 28) If $\alpha = \lim_{x \to 0^+} \left(\frac{e^{\sqrt{\tan x}} e^{\sqrt{x}}}{\sqrt{\tan x} \sqrt{x}} \right)$ and $\beta = \lim_{x \to 0} (1 + \sin x)^{\frac{1}{2} \cot x}$ are the roots of the quadratic equation $ax^2 + bx \sqrt{e} = 0$, then $12 \log_e(a + b)$ is equal to _____.
- 29) If $\int \frac{1}{\sqrt[5]{(x-1)^4(x+3)^6}} dx = A\left(\frac{\alpha x-1}{\beta x+3}\right)^B + C$, where C is constant of integration, then the value of $\alpha + \beta + 20AB$ is _____.
- 30) let $P(\alpha, \beta, \gamma)$ be the image of the point Q(1, 6, 4) in the line $\frac{x}{1} = \frac{y-1}{2} = \frac{z-2}{3}$. Then $2\alpha + \beta + \gamma$ is equal to _____.