1:		5:		9:					
2:		6:		10:					
3:		7:							
4:		8:							

Problem 1

The equation of the tangent line to the curve with parametric equations $x(t) = 2t + 1, y(t) = 3 - t^3$ at t=1 is:

SHOW ANSWER

A. $2x + 3y = 12$

B. $3x + 2y = 13$

C. $6x + y = 20$

D. $3x - 2y = 5$

E. None of the above.

Problem 2

If $x(t) = 4\cos t, y(t) = 3\sin t$, then $\int_2^4 xydx$ is equivalent to

SHOW ANSWER

A. $48\int_{\frac{\pi}{3}}^{0} \sin t\cos^2 tdt$

B. $48\int_2^4 \sin^2 t\cos tdt$

C. $36\int_2^4 \sin t\cos^2 tdt$

D. $-48\int_0^{\frac{\pi}{3}} \sin t\cos^2 tdt$

E. $48\int_0^{\frac{\pi}{3}} \sin^2 t\cos tdt$

Problem 3

The length of $x = e^t\cos t, y = e^t\sin t$ from t=2 to t=3 is

SHOW ANSWER

A. $\sqrt{2}e^2\sqrt{e^2-1}$

B. $\sqrt{2}(e^3-e^2)$

C. $2(e^3-e^2)$

D. $e^3(\cos 3+\sin 3)-e^2(\cos 2+\sin 2)$

E. None of the above.

Problem 4

The area enclosed by the four-leaved rose $r = \cos(2\theta)$ is

SHOW ANSWER

A. $\frac{\pi}{4}$

B. $\frac{\pi}{2}$

C. π

D. 2π

E. $\frac{\pi}{2} + \frac{1}{2}$

Problem 5

The rectangular equation of the parametric curve $x = 1 - \sin t$ and $y = 4 - 2\cos t$ is:

SHOW ANSWER

A. $4(x-1)^2 + (y-4)^2 = 1$

B. $4(x-1)^2 + (y-4)^2 = 4$

C. $(x-1)^2 + (y-4)^2 = 4$

D. $(x-1)^2 + (y-4)^2 = 2$

E. none of the above

Problem 6

The area bounded by the lemniscate with polar equation $r^2 = 2\cos(2\theta)$ is equal to

SHOW ANSWER

A. 4
B. 1
C. $\frac{1}{2}$
D. 2
E. None of the above

Problem 7

The graph of the polar equation $r = \dfrac{1}{\sin\theta - 2\cos\theta}$ is:

SHOW ANSWER

A. a circle
B. a line with slope 1
C. a line with slope 2
D. a parabola
E. a semi-circle

Problem 8

The power series $x + \frac{x^2}{2} + \frac{x^3}{3} + ... + \frac{x^n}{n} + ...$ converges if and only if:

SHOW ANSWER

A. $-1 < x < 1$
B. $-1 \leq x \leq 1$
C. $-1 \leq x < 1$
D. $-1 < x \leq 1$
E. $x = 0$

Problem 9

The power series $(x+1) - \frac{(x+1)^2}{2!} + \frac{(x+1)^3}{3!} - \frac{(x+1)^4}{4!} + ...$ diverges:

SHOW ANSWER

A. for no real x values
B. if $-2 < x \leq 0$
C. if $x < -2$ or $x > 0$
D. if $-2 \leq x < 0$
E. if $x \neq -1$

Problem 10

The series $\sum_{n=0}^{\infty} n!(x-3)^n$ converges if and only if

SHOW ANSWER

A. $x = 0$

B. $2 < x < 4$

C. $x = 3$

D. $2 \leq x \leq 4$

E. $x < 2$ or $x > 4$

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ANSWER KEY

1 (234)	B	5 (238)	B	9 (242)	A				
2 (235)	E	6 (239)	D	10 (243)	C				
3 (236)	B	7 (240)	C						
4 (237)	B	8 (241)	C						