

Sketch the curve represented by the parametric equations

$$x = 2|t| - t \quad \text{for } -1 \leq t \leq 2.$$

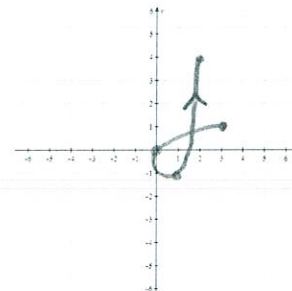
$$y = t^3 - 2t$$

SCORE: ____ / 4 PTS

Indicate the orientation (direction) of the curve.

t	x	y
-1	3	1
0	0	0
1	1	-1
2	2	4

GRADED
BY
ME



Write $\frac{8}{5} - \frac{27}{15} + \frac{64}{45} - \frac{125}{135} + \frac{216}{405} - \frac{343}{1215} + \frac{512}{3645}$ in sigma notation.

SCORE: ____ / 4 PTS

PERFECT CUBES $2^3, 3^3, \dots$

ALTERNATING

GEOMETRIC, $r=3$

$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1} (n+1)^3}{5(3)^{n-1}} \quad \text{OR} \quad \sum_{n=2}^{\infty} \frac{(-1)^n n^3}{5(3)^{n-2}}$$

GRADE AGAINST ONE VERSION
ONLY
SUBTRACT $\frac{1}{2}$ POINT IF INDEX
UNDER Σ DOESN'T MATCH
INDEX INSIDE FORMULA

Find parametric equations for the ellipse with vertices $(0, \pm 7)$ and minor axis of length 6.

SCORE: ____ / 3 PTS

$$\begin{aligned} x &= 3 \cos t \\ y &= 7 \sin t \end{aligned}$$

Prove the formula for the sum of the first n terms of a finite geometric series as shown in lecture.

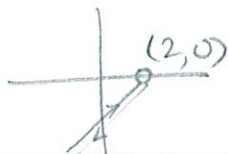
SCORE: ____ / 5 PTS

$$\begin{aligned} S_n &= a_1 + a_1 r + a_1 r^2 + \dots + a_1 r^{n-3} + a_1 r^{n-2} + a_1 r^{n-1} \\ r S_n &= a_1 r + a_1 r^2 + a_1 r^3 + \dots + a_1 r^{n-2} + a_1 r^{n-1} + a_1 r^n \\ S_n - r S_n &= a_1 - a_1 r^n \\ (1-r) S_n &= a_1 (1-r^n) \\ S_n &= \frac{a_1 (1-r^n)}{1-r} \end{aligned}$$

The parametric equations $x = 2 - t^2$ and $x = e^{-t} + 2$ both correspond to the rectangular equation $y = x - 2$. SCORE: ____ / 3 PTS
 $y = -t^2$ and $y = e^{-t}$

Explain how the parametric curves differ from each other. Be as specific as possible.

GRADED BY ME
 AS t GOES FROM $-\infty$ TO ∞ ,
 $y = -t^2$ GOES FROM $-\infty$ TO 0 TO $-\infty$ AND $y = e^{-t}$ GOES FROM ∞ TO 0



Find the sum of the infinite series $162 - 108 + 72 - 48 + 32 - \dots$. GEOMETRIC, SCORE: ____ / 2 PTS

$$S = \frac{162}{1 - (-\frac{2}{3})} = \frac{162}{\frac{5}{3}} = 162 \times \frac{3}{5} = \frac{486}{5}$$

$r = \frac{-108}{162} = -\frac{2}{3}$

Find parametric equations for the circle with center $(5, -4)$ and radius 6. SCORE: ____ / 2 PTS

$$x = 5 + 6 \cos t$$

$$y = -4 + 6 \sin t$$

To prepare for his daughter's college tuition, Chris opened a new savings account. SCORE: ____ / 4 PTS

The first month, he added \$329 into the account. Every month after that, he added \$17 more than he had added the previous month.

[a] After 11 years, how much had Chris added to the account altogether?

ARITHMETIC, $d = 17$ 11 YEARS = 132 MONTHS

$$S_{132} = \frac{1}{2}(132)(2(329) + (132-1)(17)) = \$190,410$$

[b] How much did Chris add to the account in month 93?

$$a_{93} = 329 + (93-1)(17) = \$1,893$$

Eliminate the parameter and write the rectangular equation for the curve represented by the parametric equations $x = e^{2t}$ and $y = 12t^2$. SCORE: ____ / 3 PTS

Write your final answer in the form y as a simplified function of x .

$$\ln x = 2t$$

$$t = \frac{1}{2} \ln x$$

$$y = 12 \left(\frac{1}{2} \ln x \right)^2$$

$$y = 3 (\ln x)^2$$