

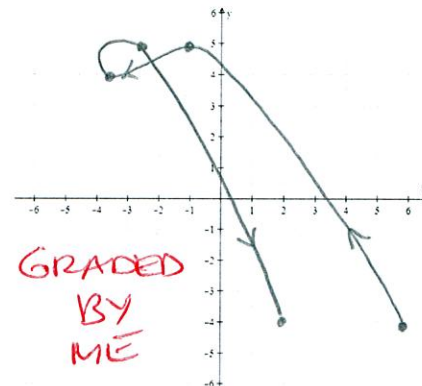
Sketch the curve represented by the parametric equations $x = 2t^2 - t - 4$ for $-2 \leq t \leq 2$.
 $y = 4 + 2t^2 - t^4$

SCORE: ____ / 5 PTS

Include the rectangular co-ordinates of 5 points on the curve. Indicate the orientation (direction) of the curve.

t	(x, y)
-2	(6, -4)
-1	(-1, 5)
0	(-4, 4)
1	(-3, 5)
2	(2, -4)

$(2\frac{1}{2}) = \frac{1}{2}$ POINT EACH



Find the value of $\sum_{p=2}^5 (p^3 - 2^p)$.

SCORE: ____ / 3 PTS

$$(8-4) + (27-8) + (64-16) + (125-32)$$

$$= \underline{4 + 19 + 48 + 93} = \underline{164}$$

$(2) = \frac{1}{2}$ POINT EACH (1)

Eliminate the parameter and write the rectangular equation for the curve represented by the parametric

SCORE: ____ / 3 PTS

equations $x = e^{-t}$
 $y = e^{5t}$. Write your final answer in the form y as a simplified function of x.

$$x = e^{-t} \rightarrow \underline{t = -\ln x} \rightarrow \underline{y = e^{-5 \ln x}} = (e^{\ln x})^{-5} = \underline{x^{-5}}$$

$$\text{OR } x = e^{-t} \rightarrow \underline{e^t = x^{-1}} \rightarrow \underline{y = (e^t)^5 = (x^{-1})^5 = x^{-5}}$$

GRADE AGAINST ONE COLOR VERSION ONLY

Simplify the expression $\frac{(4n-2)!}{(4n+1)!}$.

SCORE: ____ / 3 PTS

$$\frac{(4n-2)!}{(4n+1)(4n)(4n-1)(4n-2)!} = \frac{1}{4n(4n+1)(4n-1)}$$

$(\frac{1}{2})$ $(\frac{1}{2})$

A cliff diver jumps off a 50 foot cliff at an angle of 30° with the horizontal, at a speed of 6 feet per second. Find parametric equations that model the diver's trajectory (path).

SCORE: ____ / 3 PTS

$$x = (v_0 \cos \theta)t = (6 \cos 30^\circ)t = 3\sqrt{3}t \quad (1)$$

$$y = h_0 + (v_0 \sin \theta)t - 16t^2 = 50 + (6 \sin 30^\circ)t - 16t^2$$

$$= 50 + 3t - 16t^2 \quad (1/2)$$

Write $\frac{3^2}{5} - \frac{4^2}{11} + \frac{5^2}{17} - \frac{6^2}{23} + \frac{7^2}{29} - \frac{8^2}{35} + \frac{9^2}{41}$ in sigma notation.

SCORE: ____ / 4 PTS

$n=1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7$ ← ARITHMETIC $d=6$

$$\sum_{n=1}^7 (-1)^{n+1} \frac{(n+2)^2}{5+6(n-1)} = \sum_{n=1}^7 (-1)^{n+1} \frac{(n+2)^2}{6n-1}$$

(1) (1/2) (1/2) OR

Find parametric equations for the ellipse with vertices $(-1, 2)$ and $(-1, 8)$, and foci $(-1, 3)$ and $(-1, 7)$.

SCORE: ____ / 5 PTS

CENTER = $(-1, 5)$

$$\left\{ \begin{matrix} \cdot \\ \cdot \end{matrix} \right\}_2 \Bigg\}_3$$

$$b^2 = 3^2 - 2^2 = 5$$

$$b = \sqrt{5}$$

$$x = -1 + \sqrt{5} \cos t$$

$$y = 5 + 3 \sin t$$

(1/2) (1) (1) (1)

MUST BE IN
PARAMETRIC
FORM TO
EARN POINTS

Write the first five terms of the sequence defined recursively by $a_n = n! - a_{n-1}$, $a_1 = 7$.

SCORE: ____ / 4 PTS

Write your final answer as a sequence.

$$a_2 = 2! - a_1 = 2 - 7 = -5$$

$$a_3 = 3! - a_2 = 6 - (-5) = 11$$

$$a_4 = 4! - a_3 = 24 - 11 = 13$$

$$a_5 = 5! - a_4 = 120 - 13 = 107$$

SUBTRACT 1/2 POINT
IF NOT IN A LIST

7, -5, 11, 13, 107

(4) SUBTRACT 1 POINT
FOR EACH ERROR