

# BATTLESHIP



# Rules

1. No calculators, books, or phones.
2. Teams alternate choosing targets. Every person takes a turn and can consult team members before answering the question. If correct, the target is revealed. The first team to uncover all 3 battleships wins.
3. Every person should work every problem even if it's not their team's problem.
4. If a person is not participating or has a phone out, the team loses a turn, and that person receives a big fat zero for a daily grade.



1

2

3

4

5

6

7

8

A

B

C

D


**Ships Remaining:**

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**Questions:**

[A1](#)

[A2](#)

[A3](#)

[A4](#)

[A5](#)

[A6](#)

[A7](#)

[A8](#)

[B1](#)

[B2](#)

[B3](#)

[B4](#)

[B5](#)

[B6](#)

[B7](#)

[B8](#)

[C1](#)

[C2](#)

[C3](#)

[C4](#)

[C5](#)

[C6](#)

[C7](#)

[C8](#)

[D1](#)

[D2](#)

[D3](#)

[D4](#)

[D5](#)

[D6](#)

[D7](#)

[D8](#)



# TARGET: A1

**What are the first 3 terms of the Maclaurin series for  $\sin x$ ?**



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# TARGET: A2

= + Find —,

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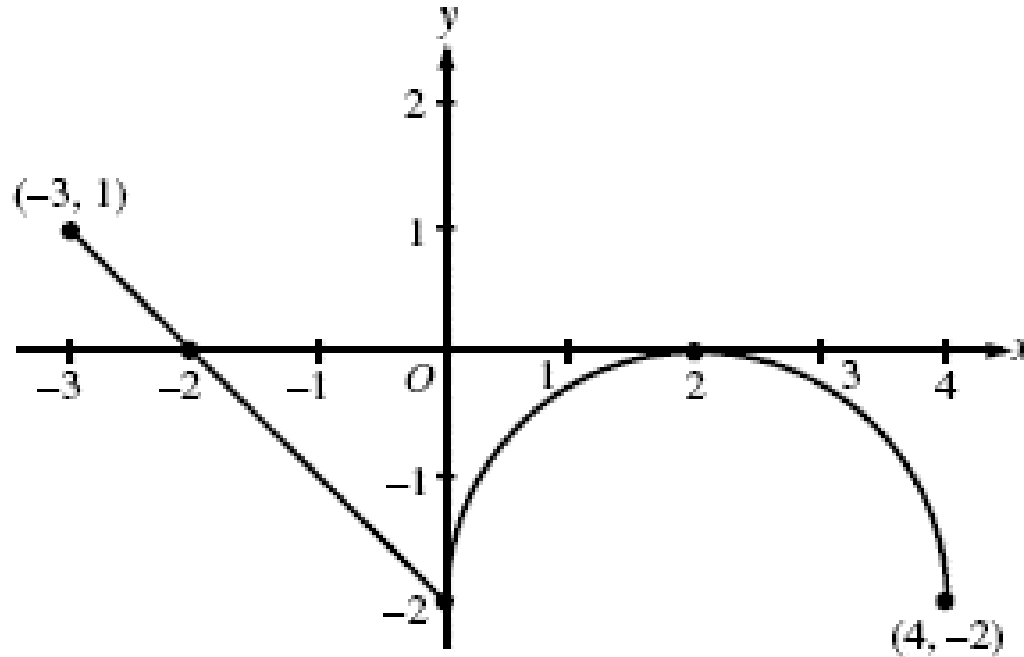
# TARGET: A3

What is the average value of  
 $f(x) = e^x$  on  $[0,3]$ ?



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# TARGET: A4



This is a graph of  $f'(x)$ . Where is  $f(x)$  decreasing?

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# TARGET: A5

$$x(t) = t^2 + 1 \quad y(t) = t^3 + 2$$

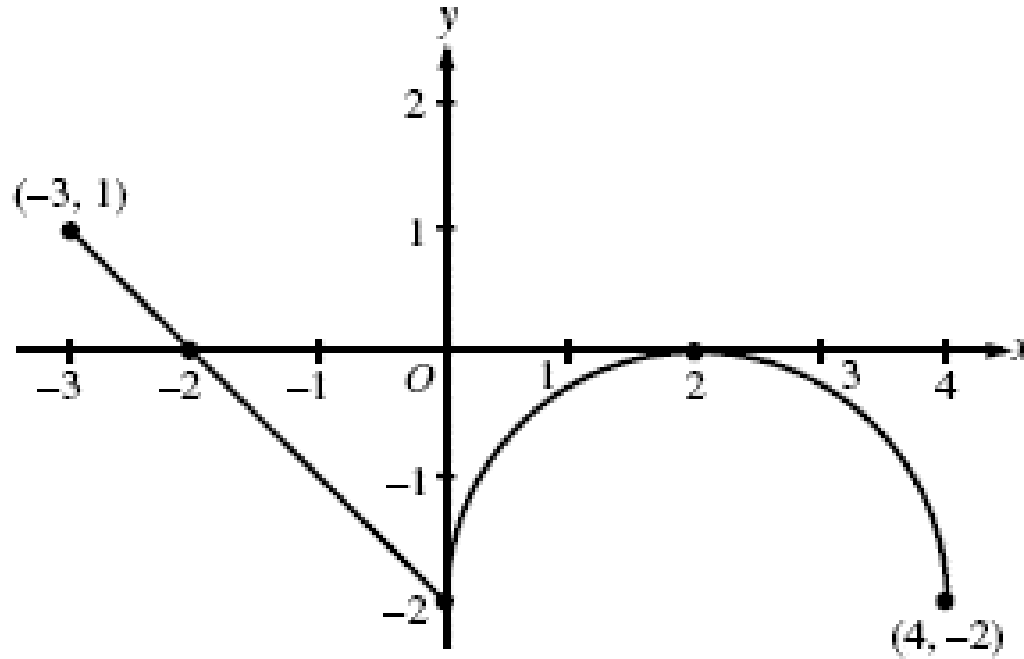
Find the speed at  $t=2$ .



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# TARGET: A6



This is the graph of  $f(x)$ . Find

$$\int ( ) .$$

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# TARGET: A7

$$x = t^2 \quad y = 2t^3 + 1$$

Find  $\frac{d^2 y}{dx^2}$



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# TARGET: A8

What are the first 3 terms of the  
Maclaurin Series for  $e^x$  ?



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# TARGET: B1

**What are the 3 conditions of Rolle's Theorem?**



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# TARGET: B2

**What is the formula for finding polar area?**



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# TARGET: B3

**What is the Mean Value Theorem? Don't forget to include the conditions.**



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# TARGET: B4

<b>x</b>	<b>1</b>	<b>3</b>	<b>6</b>
<b>f(x)</b>	<b>10</b>	<b>20</b>	<b>40</b>

**Estimate  $f'(2)$ .**



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# TARGET: B5

<b>x</b>	<b>1</b>	<b>3</b>	<b>6</b>
<b>f(x)</b>	<b>10</b>	<b>20</b>	<b>40</b>

Estimate  $\int_1^6 f(x)dx$

using a trapezoidal approximation  
with 2 subintervals.

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# TARGET: B6

**$f(x)$  is a continuous, increasing function. Is a left Riemann sum an over or under approximation?**



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# TARGET: B7

**$f''(x) < 0$ . Will a tangent line approximation for  $f(x)$  be an under or over approximation?**



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# TARGET: B8

Solve the differential equation.

$y' = (y + 1)$  with initial  
condition  $(0, 2)$ .



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# TARGET: C1

Set up an integral that gives the total distance traveled on  $[1,3]$ .

$= +$  and  $= +$  .



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# TARGET: C2

$$= \theta$$

Write an expression for  $x$ .



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# TARGET: C3

When is a particle is speeding up?



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# TARGET: C4

Find the antiderivative of

$\int$



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# TARGET: C5

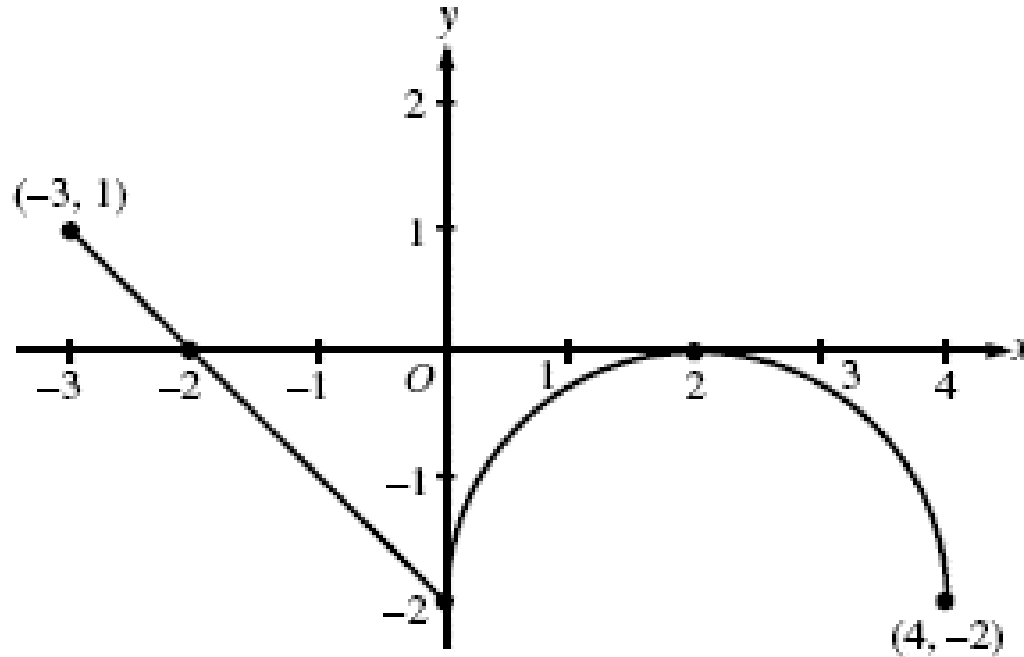
Find the antiderivative of

$$\int \frac{\quad}{\quad + \quad}$$



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# TARGET: C6



This is a graph of  $f'(x)$ . Where is  $f(x)$  concave down?

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# TARGET: C7

Does  $\sum_{n=1}^{\infty} \frac{1}{n^2}$

converge or diverge and by which convergence test?

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# TARGET: C8

$$-\int ()$$



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# TARGET: D1

Does  $\sum_{n=1}^{\infty} \frac{1}{n^2}$

converge or diverge and by which convergence test?

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# TARGET: D2

Does  $\sum_{i=1}^{\infty} \frac{1}{i!}$

converge or diverge?



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# TARGET: D3

Does  $\sum^{\infty} /$

converge or diverge?



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# TARGET: D4

**What is the general formula for a Taylor series centered at  $x=a$ ?**



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# TARGET: D5

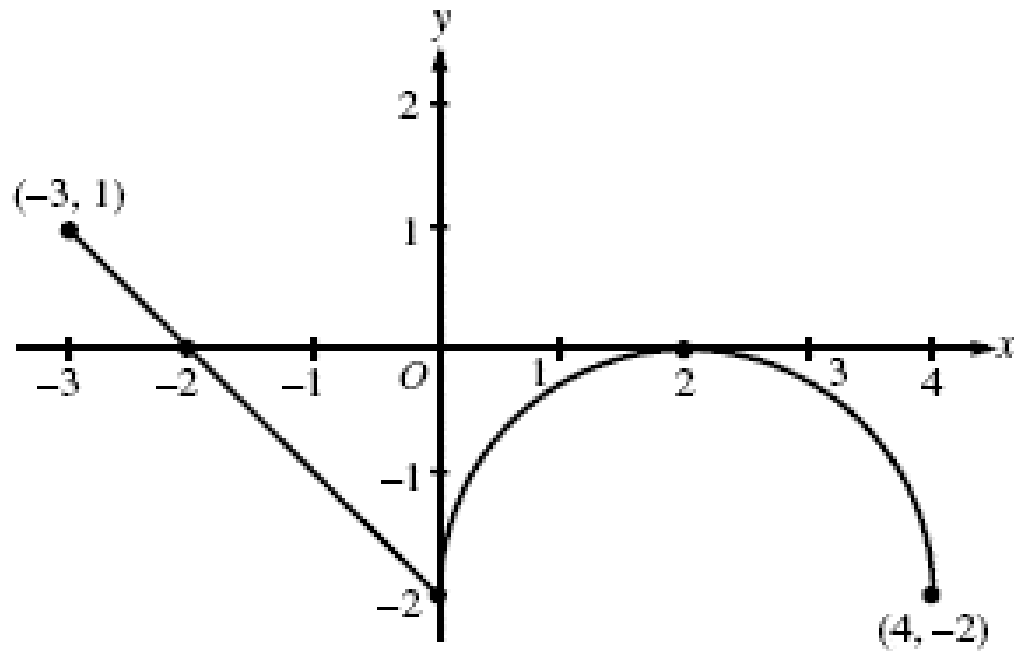
Given

$$\int f'(x) = f(x) = .$$

Find  $f(x)$

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# TARGET: D6



**This is the graph of  $f'(x)$ . What are the  $x$  – coordinates of the critical numbers? Determine**

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# TARGET: D7

**What's the general term for the  
Maclaurin series for  $\cos x$ ?**



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# TARGET: D8


$$\int$$


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