

$\sum_{a=m}^n e$: key

AP Calculus AB: 7.1 Summation & Area

Solve summation by hand writing out each term

1. $\sum_{i=1}^3 (2i + 1)$

$[2(1)+1] + [2(2)+1] + [2(3)+1]$
 $3 + 5 + 7 = \boxed{15}$

2. $\sum_{i=4}^7 3i$

$3 \sum_{i=4}^7 i$
 $3(4+5+6+7)$
 $\boxed{66}$

3. $\sum_{i=1}^4 (-1)^i$

$[(-1)^1] + [(-1)^2] + [(-1)^3] + [(-1)^4]$
 $\boxed{0}$

4. $\sum_{i=2}^5 \frac{i^2}{3}$

$\frac{1}{3} \sum_{i=2}^5 i^2$
 $\frac{1}{3} (2^2 + 3^2 + 4^2 + 5^2) = \frac{1}{3} (54) = \frac{54}{3} = \boxed{18}$

Solve summation by calculator

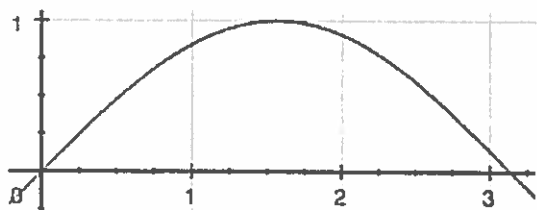
5. $\sum_{i=1}^{15} (i + 4)^2$

$\boxed{2440}$

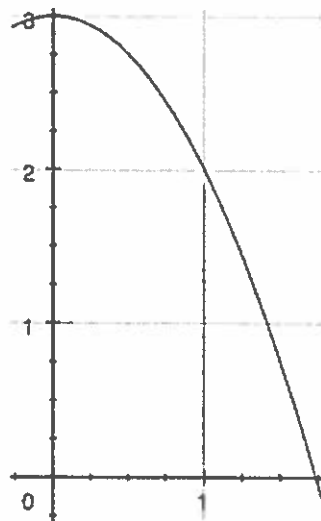
6. $\sum_{i=20}^{43} i^3 - 2i^2$

$\boxed{808,888}$

Estimate the integral of the following functions



$\approx \boxed{2}$



$\approx \boxed{3.5}$

$$\sum_{a=m}^n e: \underline{\hspace{2cm}}$$

Flashback

x	-2	$-2 < x < -1$	-1	$-1 < x < 1$	1	$1 < x < 3$	3
$f(x)$	12	Positive	8	Positive	2	Positive	7
$f'(x)$	-5	Negative	0	Negative	0	Positive	$\frac{1}{2}$

1. The table above is for a graph of $f(x)$ that is both continuous and differentiable.

(a) When is the function $f(x)$ decreasing?

$[-2, 1]$ because $f'(x)$ is negative

(b) Where does $f(x)$ have critical values and are they max or min values?

$x=1$ is a min because $f'(x)$ switches from negative to positive.

(c) Find the average rate of change from $-2 \leq x \leq 1$.

$$\frac{f(1) - f(-2)}{1 - (-2)} = \frac{2 - 12}{3} = \boxed{\frac{-10}{3}}$$

2. Find the interval(s) where the function is increasing or decreasing on the graph

$$f(x) = (2x - 6)e^{2x}$$

$$f'(x) = 0$$

$$(2x - 6)2e^{2x} + e^{2x}(2) = 0$$

$$2e^{2x}(2x - 6) = 0$$

$$\cancel{2e^{2x}} \cdot 2x - 6 = 0$$

$$x = 3$$



$$f'(0) = 2e^{2(0)}(2(0) - 6) = -$$

$$f'(4) = 2e^{2(4)}(2(4) - 6) = +$$

inc from $(-\infty, 3]$ $f'(x)$ is pos
dec from $[3, \infty)$ $f'(x)$ is neg