$f(x): x^3 - 3x + 2$

x Axis
x = -2
x = 1 } 6 sub intervals

a). curve

$f(x): x^3 - 3x + 2$

$-2 \leq x \leq 2$

x	f(x)	
-2	0	✓
-1	4	✓
0	2	✓
1	0	✓
2	4	✓
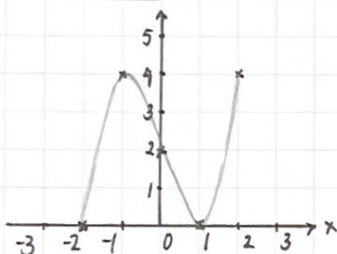
$(-2)^3 - 3(-2) + 2 = 0$
$(-1)^3 - 3(-1) + 2 = 4$
$(0)^3 - 3(0) + 2 = 2$
$(1)^3 - 3(1) + 2 = 0$
$(2)^3 - 3(2) + 2 = 4$

b). left - Riemann

interval: $\frac{1-(-2)}{6} = \frac{3}{6} = \frac{1}{2} = 0.5$

∴ $-2 \to 0.5$

$x = -2, -1.5, -1, -0.5, 0, 0.5$

$f(-2): 0$
$f(-1.5): (-1.5)^3 - 3(-1.5) + 2 : 3.125$
$f(-1): (-1)^3 - 3(-1) + 2 = 4$
$f(-0.5): (-0.5)^3 - 3(-0.5) + 2 : 3.375$
$f(0): 2$
$f(0.5): (2)^3 - 3(2) + 2 :$
$\quad : (0.5)^3 - 3(0.5) + 2 : 0.625$

Area: interval x sum of f(x)

A: $0.5 \times (0 + 3.125 + 4 + 3.375 + 2 + 0.625)$

$: 6.5625$

c). Right - Riemann

interval: $\frac{1-(-2)}{6} = \frac{3}{6} = \frac{1}{2} = 0.5$

∴ $-2 \to 0.5$

$x: -2, -1.5, -1, -0.5, 0, 0.5$

$f(-2): 0$
$f(-1.5): 3.125$
$f(-1): 4$
$f(0.5): 3.375$
$f(0): 2$
$f(0.5): 0.625$

Area: interval x sum of f(x)

A: $0.5 \times (0 + 3.125 + 4 + 3.375 + 2 + 0.625)$

$: 6.5625$

d). Mid - Riemann

$x_i \leq x \leq x_{ii}$

$X_i = \frac{-2 + (-1.5)}{2} = -1.75$ $X_{ii} = \frac{0.5 + 1}{2} : 0.75$

∴ $x = -1.75, -1.25, -0.75, -0.25, 0.25, 0.75$
(+0.5 +0.5 +0.5 +0.5)

$f(-1.75): (-1.75)^3 - 3(1.75) + 2 = 1.8906$
$f(-1.25): (-1.25)^3 - 3(1.25) + 2 = 3.7969$
$f(-0.75): (0.75)^3 - 3(-0.75) + 2 = 3.8281$
$f(-0.25): (-0.25)^3 - 3(-0.25) + 2 = 2.7344$
$f(0.25): (0.25)^3 - 3(0.25) + 2 = 1.2656$
$f(0.75): (0.75)^3 - 3(0.75) + 2 = 0.1719$

Area: interval x sum of f(x)

A: $0.5 \times (1.8906 + 3.7969 + 3.8281 + 2.7344 + 1.2656 + 0.1719)$

$: 6.84375$

≈ 6.8438