MATH 1A - PROBLEM SET (33)

* PROBLEM 33.1

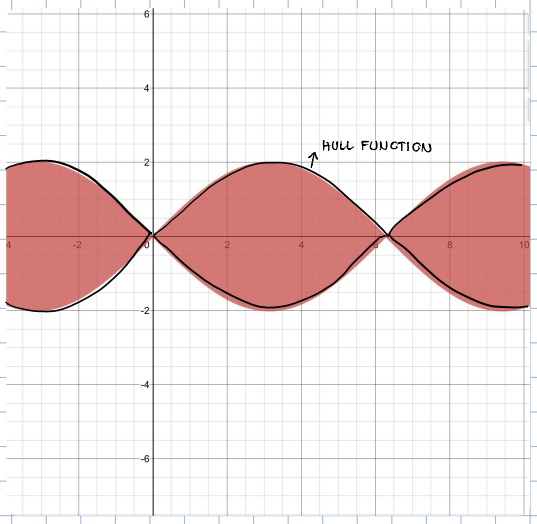
A) $f(x) = \cos(200x) - \cos(201x)$

B) $f(x) = \cos(x) + \cos(\tan(1000\sqrt{x}))$

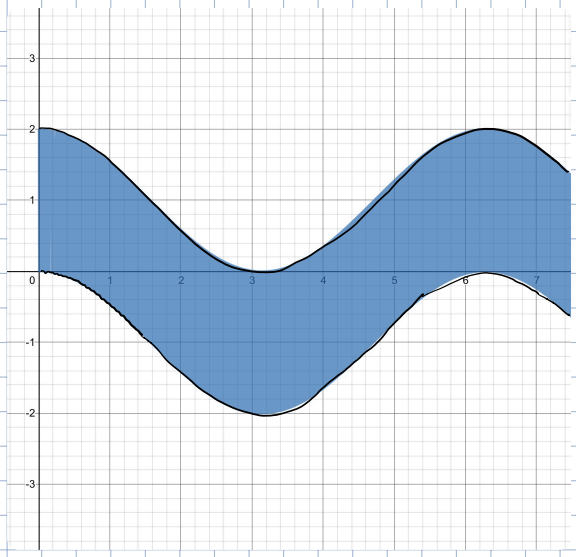
C) $f(x) = \sqrt{x}\cos(10000x)$

D) $f(x) = \cos(x)\sin(e^{2x})/2$

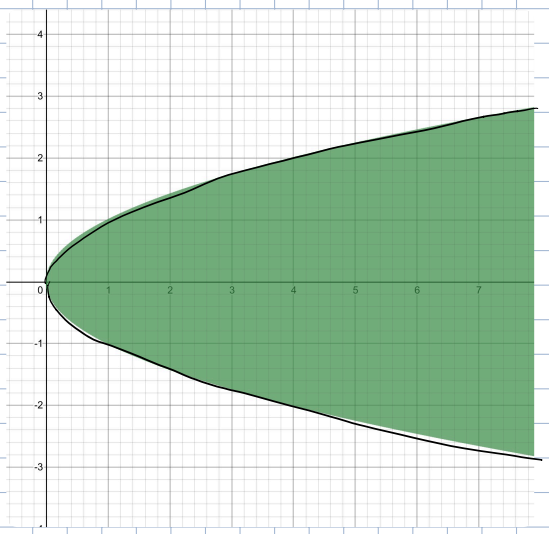
A) $f(x) = \cos(200x) - \cos(201x)$



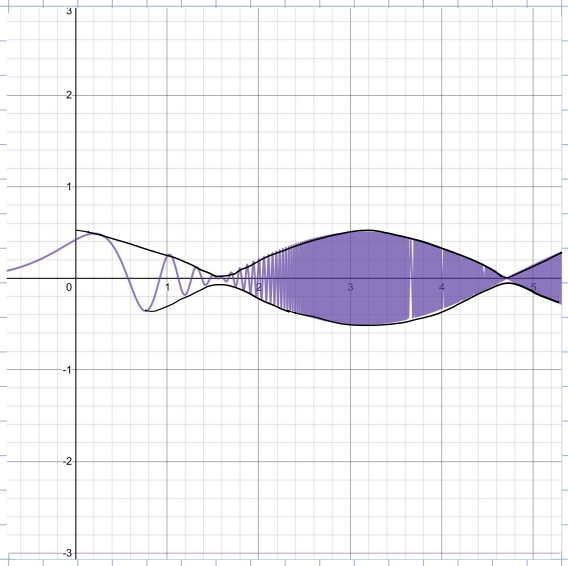
B) $f(x) = \cos(x) + \cos(\tan(1000\sqrt{x}))$



C) $f(x) = \sqrt{x}\ \cos(10\,000x)$



D) $f(x) = \cos(x)\,\sin(e^{2x})/2$



✳ PROBLEM 33.2

$f(x) = \cos(x)\sin(1000x)$

✳ PROBLEM 33.3

$\sqrt[8]{3}$ = BASIC FREQUENCY CHANGE

* PROBLEM 33.4

A) $s = 22$

$f = ?$

$f(s) = 440\,Hz \cdot 2^{(s-69)/12}$

$f(22) = 440\,Hz \cdot 2^{(22-69)/12}$

$\boxed{f(22) = 29.1352\,Hz}$

B) $f = 2060\,Hz$

$s = ?$

$f(s) = 440\,Hz \cdot 2^{(s-69)/12}$

$2060\,Hz = 440\,Hz \cdot 2^{(s-69)/12}$

$\frac{103}{22} = 2^{(s-69)/12}$

$\frac{s-69}{12} = \log_2\left(\frac{103}{22}\right)$

$s - 69 = 12\log_2\left(\frac{103}{22}\right)$

$s = 12\log_2\left(\frac{103}{22}\right) + 69$

$\boxed{s = 95.72483}$

* PROBLEM 33.5

A) $\frac{25}{64}$ $\quad n = 25$, $m = 64$

$G(n,m) = G(25,64)$

$25 \cdot 64 = 1600$

$1600 = 2^6 \cdot 5^2$

$G(25,64) = 1 + (5-1) + (5-1) + 6$

$= 1 + 4 + 4 + 6$

$= 15$

$\boxed{G(25,64) = 15}$

B) $\frac{5904}{65536}$ $\quad n = 5904$, $m = 65\,536$

$G(n,m) = G(5904, 65\,536)$

$5904 \cdot 65\,536 = 386924544$

$= 2^{20} \cdot 3^2 \cdot 41$

$G(5904, 65\,536) = 1 + 20(2-1) + 2(3-1) + (40-1)$

$= 1 + 20 + 4 + 39$

$= 64$

$\boxed{G(5904, 65536) = 64}$