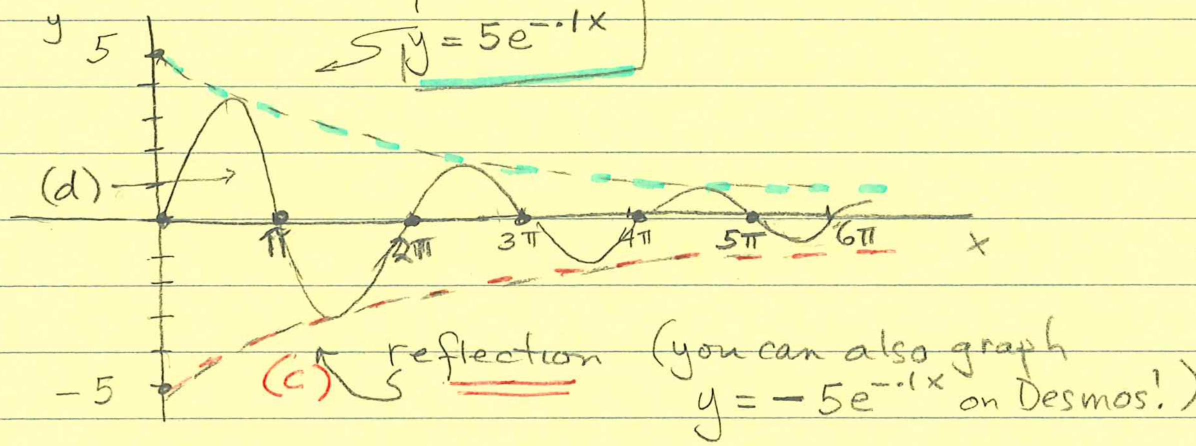
1 $y = 5e^{-.1x}\sin(x)$

(a) The amplitude is controlled by $5e^{-.1x}$

(b)



(e) Checks out on Desmos - also Desmos shows the zeros (x-intercepts) clearly!

(f) The zeros for $y=5e^{-.1x}\sin x$ and $y=\sin x$ are the same! Why?

Zeros of $\sin(x)$	plug into $5e^{-.1x}\sin x$
Observe: $x=0$	$5e^{0}\sin(0)=5\cdot 0=\underline{0}$
$x=\pi$	$5e^{-.1\pi}\sin(\pi)= \star \cdot 0 = \underline{0}$
$x=2\pi$	$5e^{-.1(2\pi)}\sin(2\pi) = \star \cdot 0 = \underline{0}$
etc.	

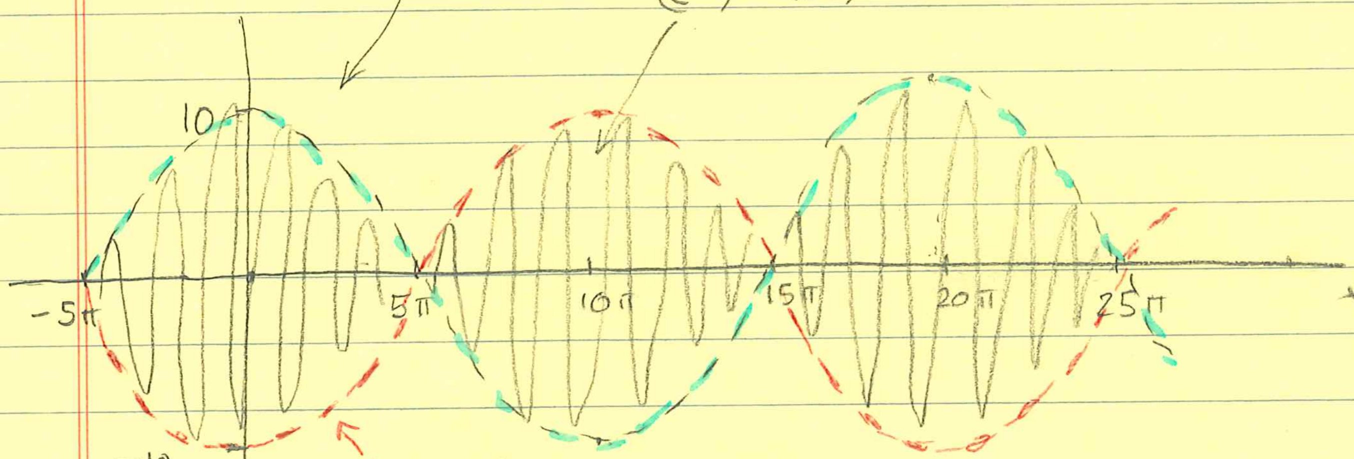
So any x-value that makes $\sin(x)=0$ will make $e^{-.1x}\sin(x)=0$ <u>also</u>, since we end up multiplying by ZERO.

2. $y = 10\cos(.1x)\sin(2x)$ (B_1 = .1, B_2 = 2)

(a) The smaller $\underline{B}$ is, the longer the period so $\underline{\cos(.1x)}$ will have a longer period.

(b) $y = 10\cos(.1x)$

(c) (d) Checks out on Desmos!

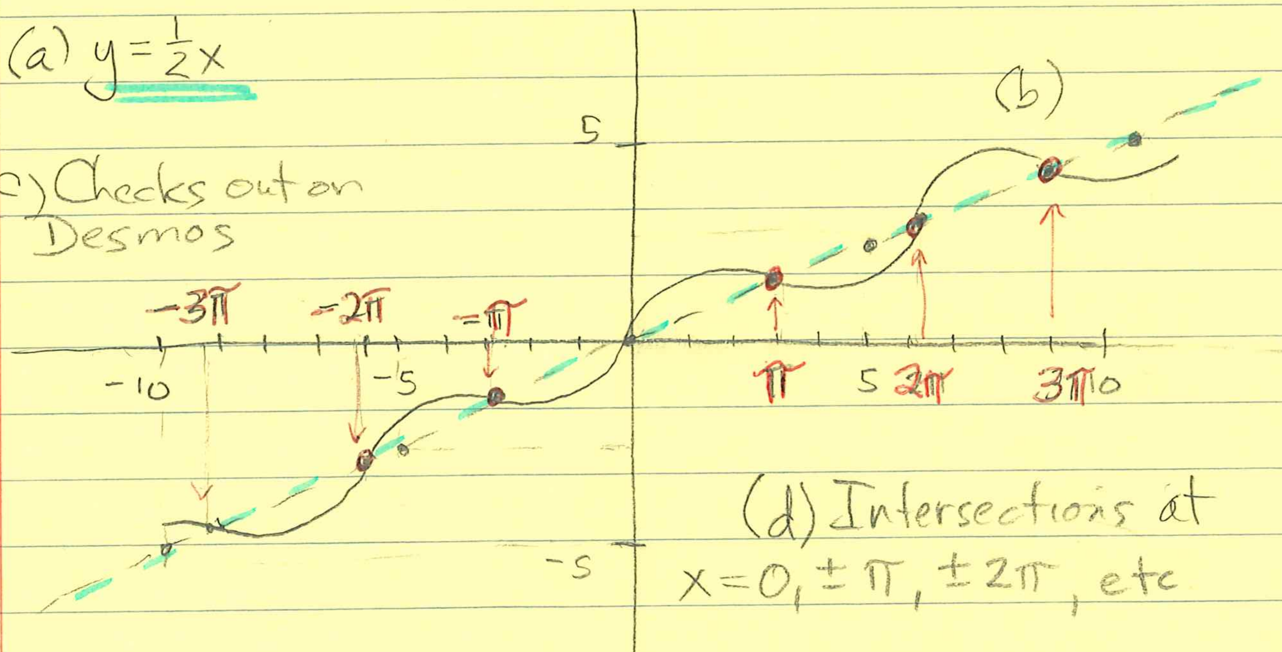


(b) reflection (you can also graph $y = -10\cos(.1x)$ on Desmos!)

3. (a) $y = \frac{1}{2}x$

(b)

(c) Checks out on Desmos



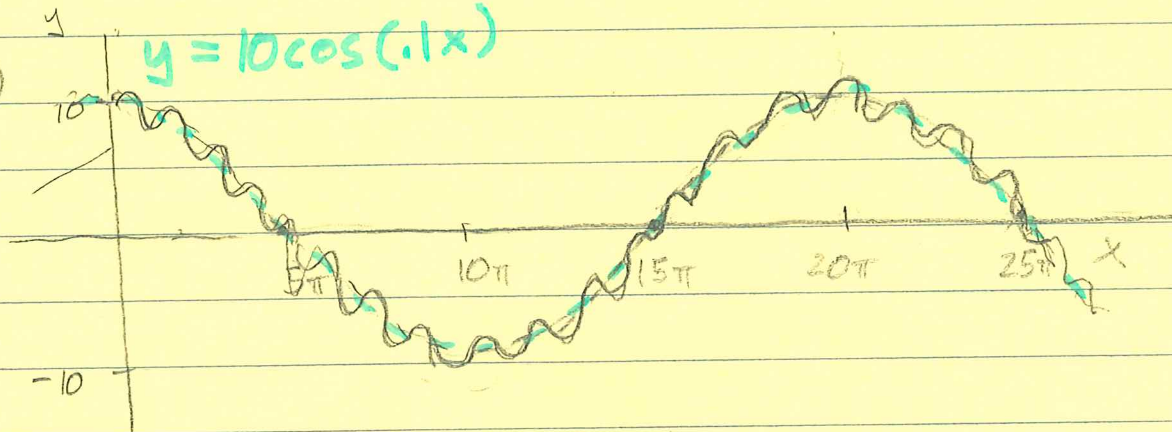
(d) Intersections at $x = 0, \pm\pi, \pm 2\pi$, etc

4. $y = 10\cos(.1x) + \sin(2x)$

(a) Guess: The wave with the larger amplitude will be the base.

(b)

(c)



(d) Checks out!

(e) The larger amplitude ⇒ louder sound

lower frequency ⇒ low notes

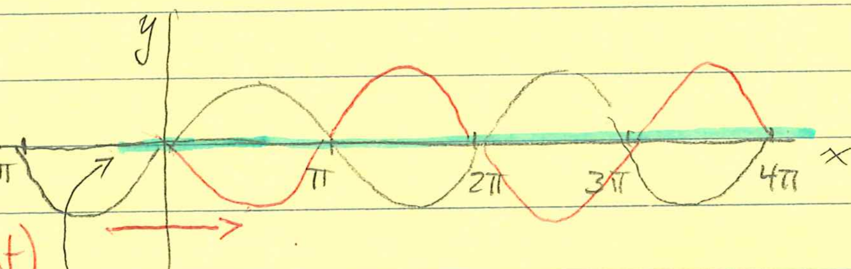
higher frequency ⇒ higher notes

So light, higher notes with loud bass beat is how this would sound!

5. (a) $y = \sin(x)$

$y = \sin(x - \pi)$

(shift 1st graph π units to the right)



(b) $y = \sin(x) + \sin(x - \pi)$

should zero each other out!

(c) Yes! Checks out on Desmos!