Today

- More trig review

- Rhythmic processes

- Reminders:

  - OSH 7 due Monday

  - Final exam – Dec 6 @ 3:30 in SRC (ABC)

Trig review

Which of the following is false?

(A) $\cos(\arctan(\sqrt{3})) = 1/2$

(B) $\sin(\arccos(1/2)) = \sqrt{3}/2$

(C) $\arctan(1) = \pi/4$

(D) $\arcsin(1/2) = \pi/3$

(E) $\sin(3\pi/2) = -1$

Note: $\cos^{-1}(x) = \arccos(x)$, $\tan^{-1}(x) = \arctan(x)$.

Trig review

Which of the following is false?

(A) cos(arctan(sqrt(3))) = 1/2

(B) sin(arccos(1/2)) = sqrt(3)/2

(C) arctan(1) = π/4

(D) arcsin(1/2) = π/3

(E) sin(3π/2) = –1

Trig review

Which is true for all x and y?

(A) $\cos(x+y) = \cos(x)\cos(y) + \sin(x)\sin(y)$

(B) $\cos(x+y) = \cos(x)\sin(y) - \sin(x)\cos(y)$

(C) $\cos(x+y) = \cos(x)\cos(y) - \sin(x)\sin(y)$

Trig review

Which is true for all x and y?

(A) cos(x+y) = cos(x)cos(y) + sin(x)sin(y)

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(C) cos(x+y) = cos(x)cos(y) – sin(x)sin(y)

Plug in x=θ and y=-θ to check each one.
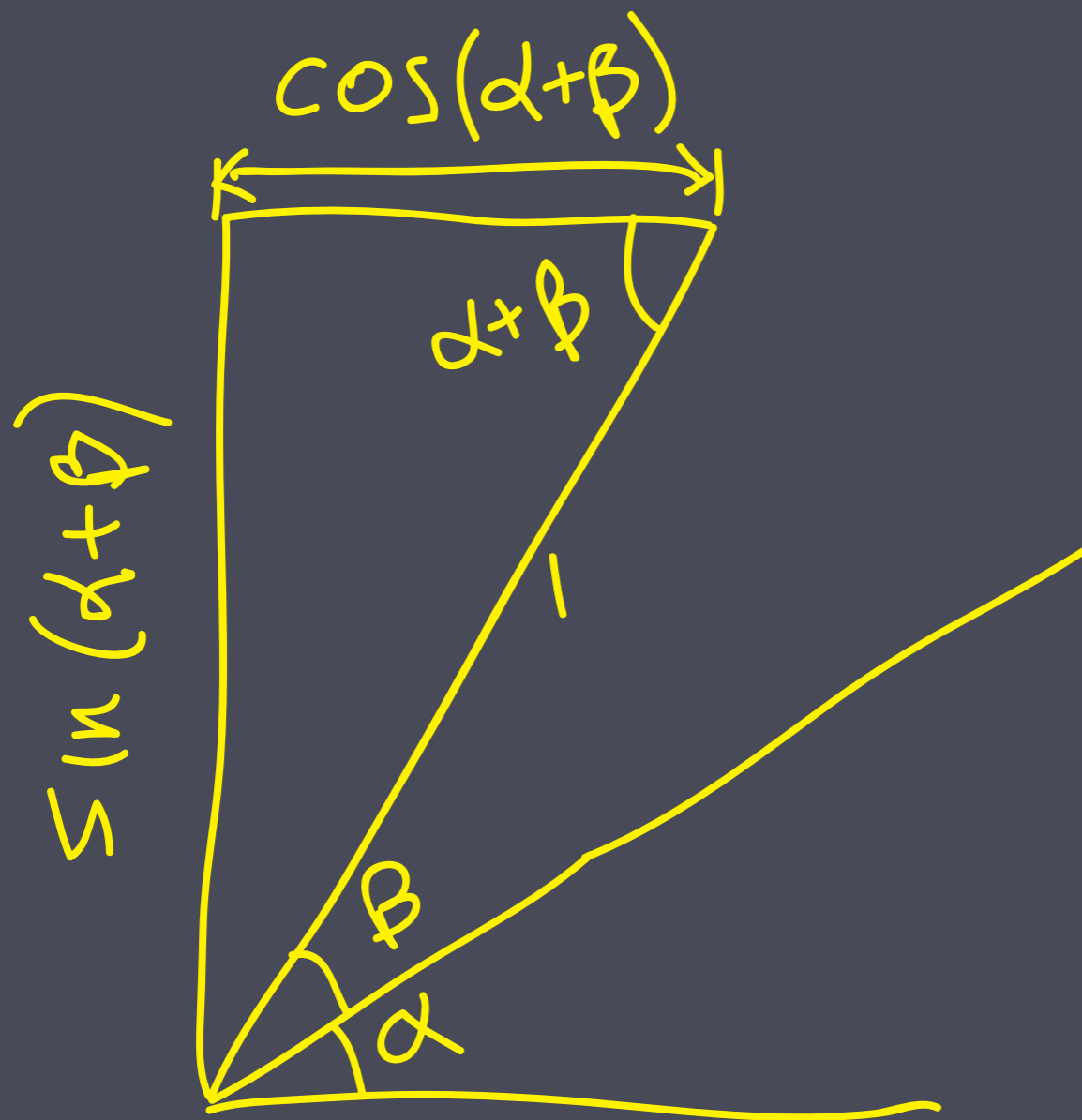Or leave x as is and sub in y=0 and v.v.

Trig review

For the more ambitious student:

Trig review
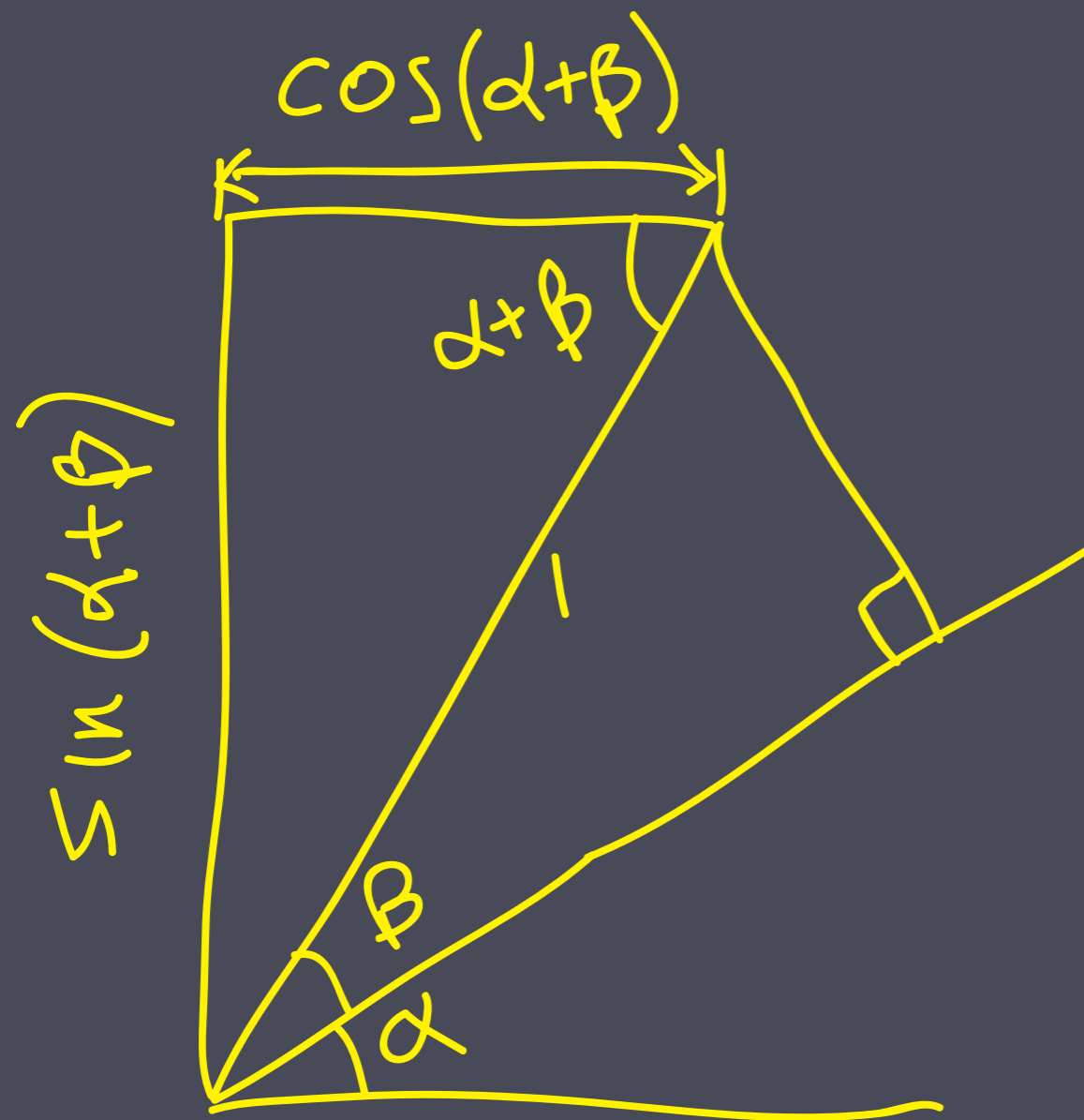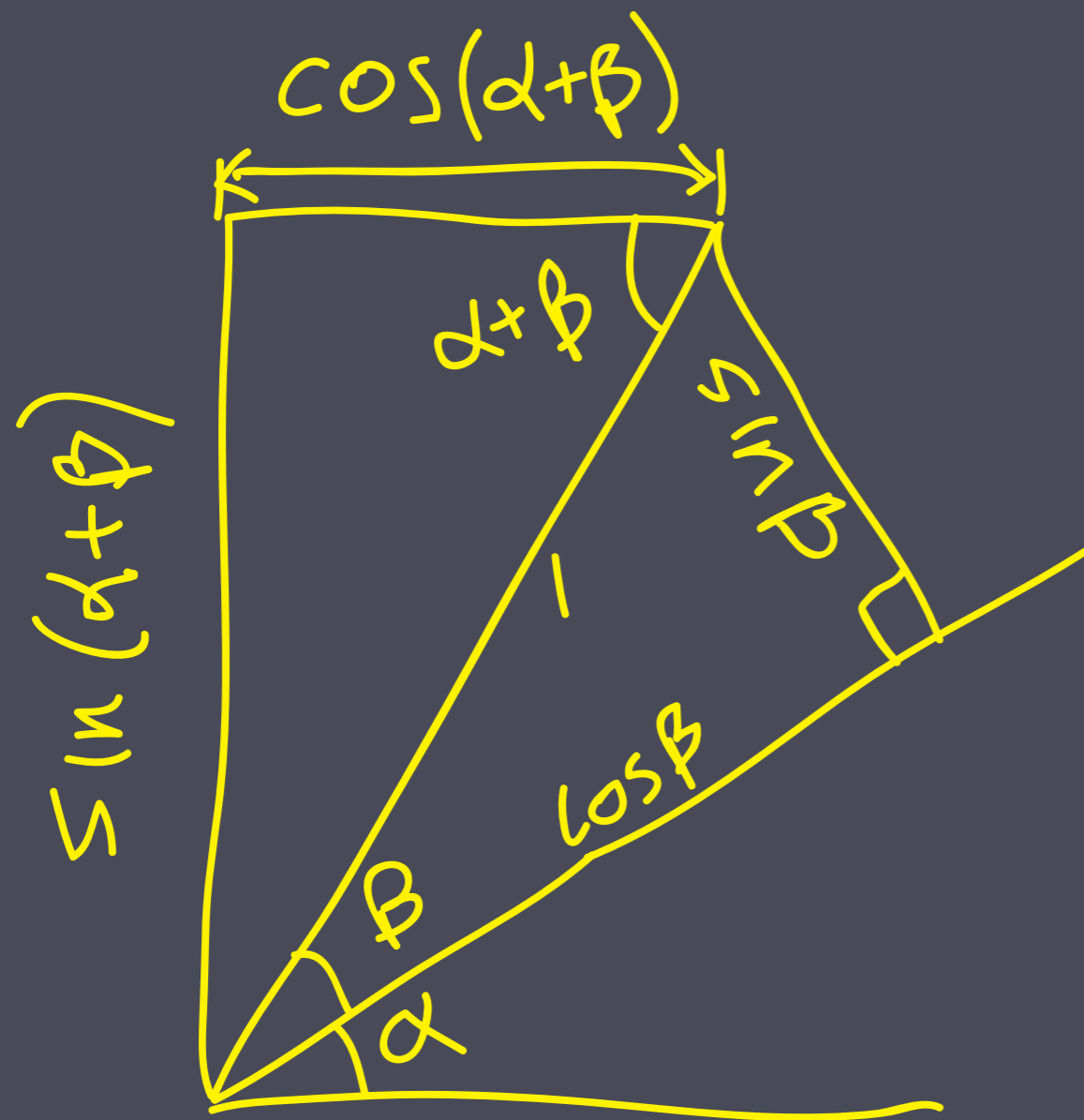
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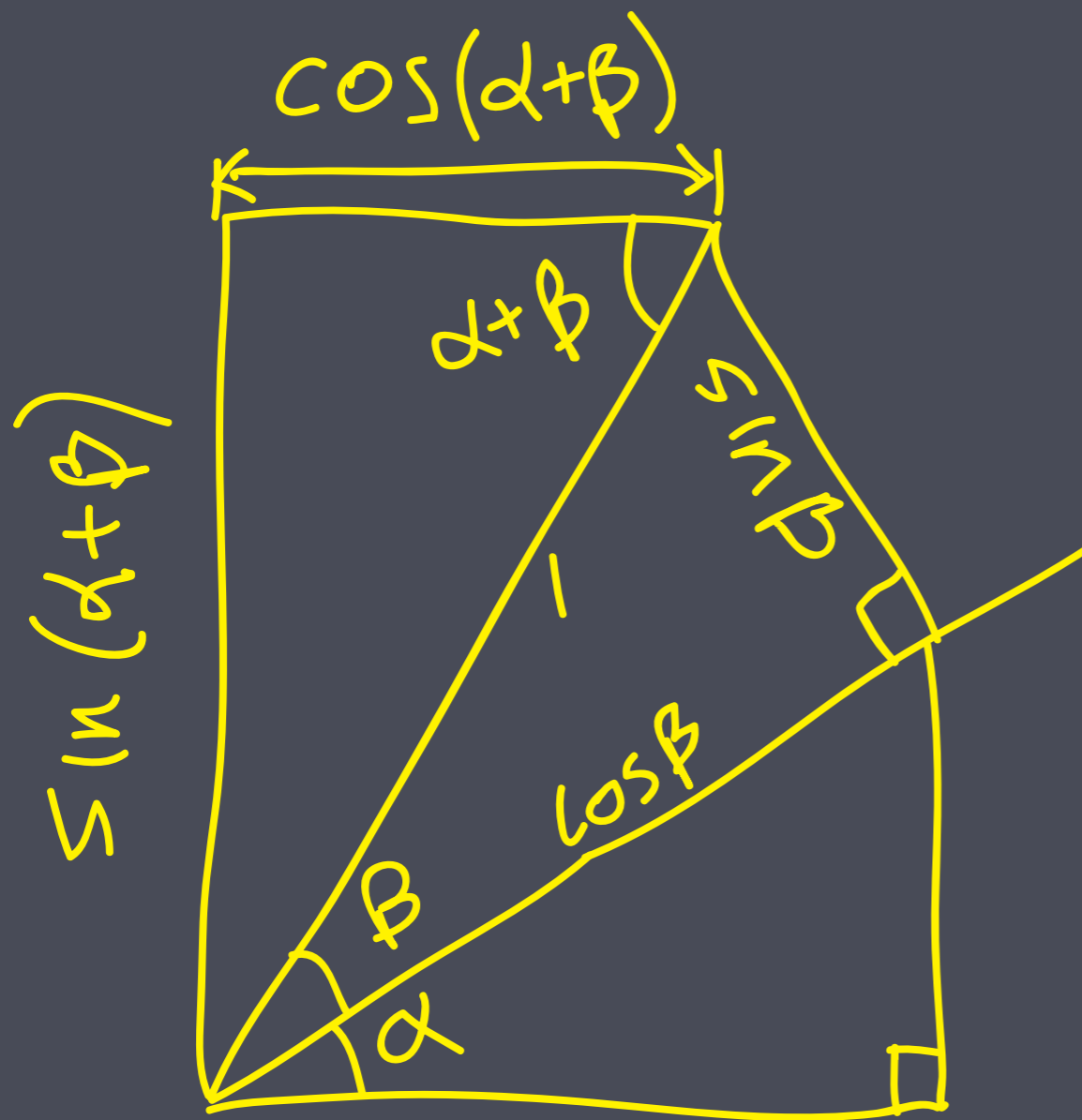For the more ambitious student:

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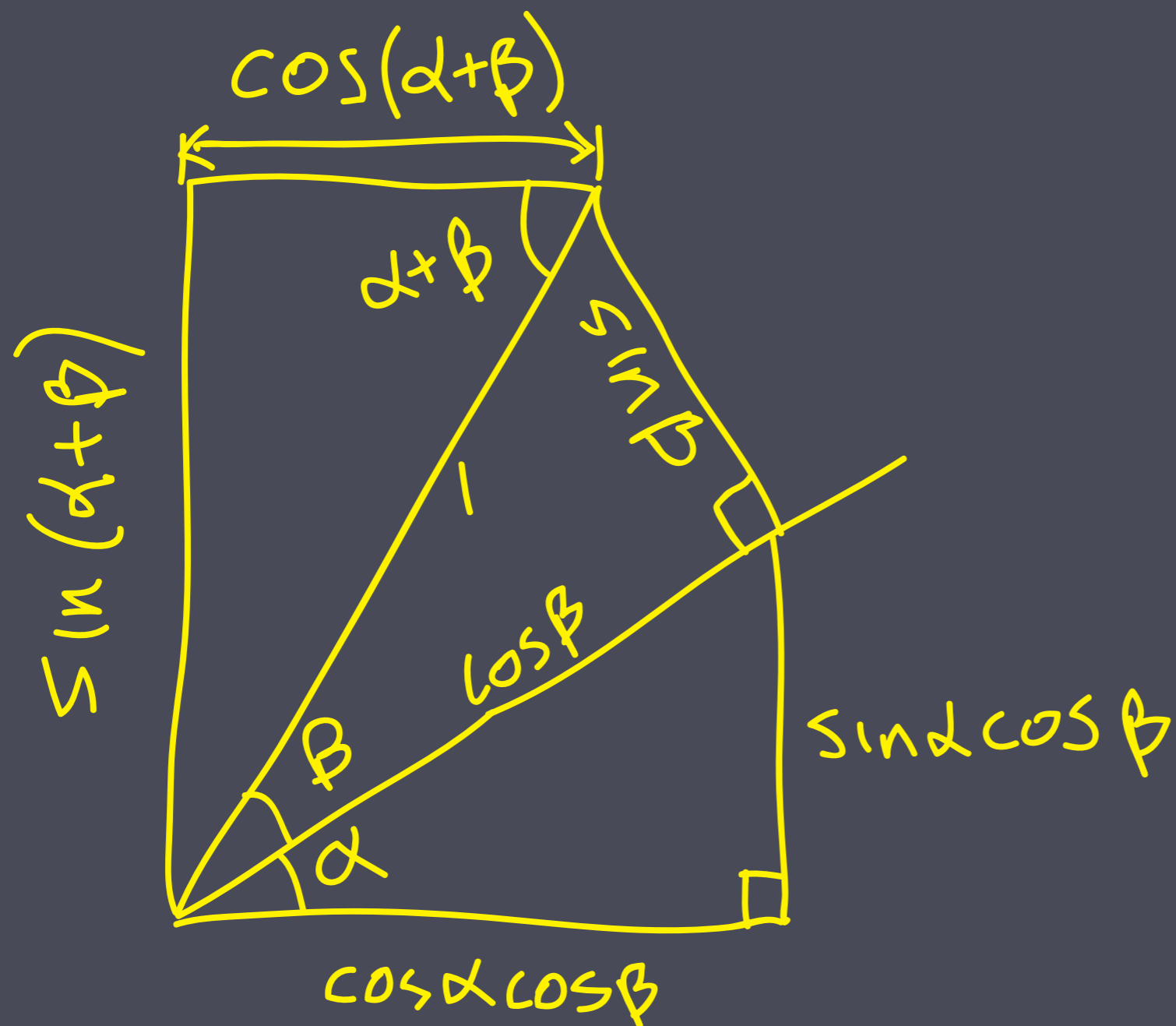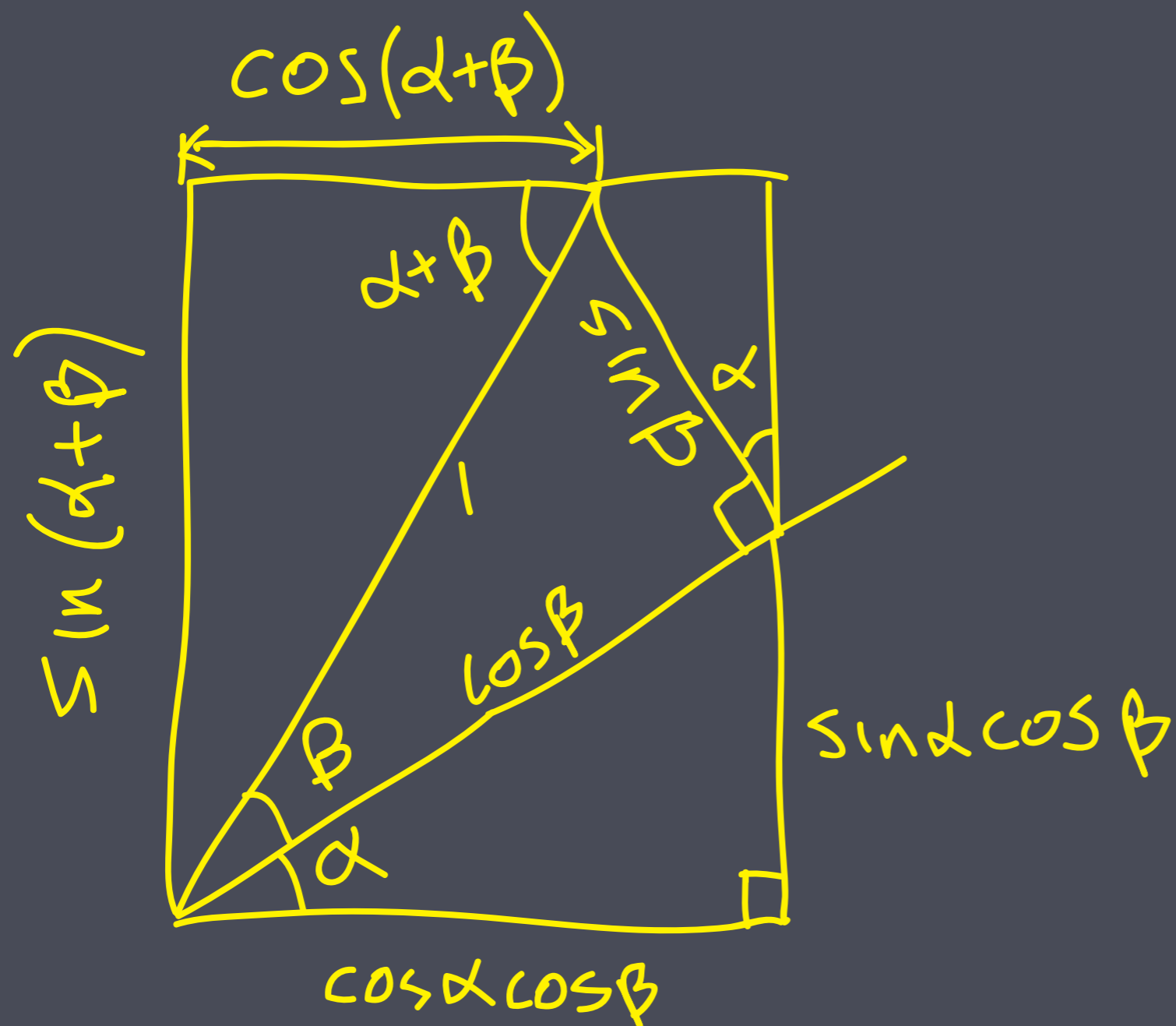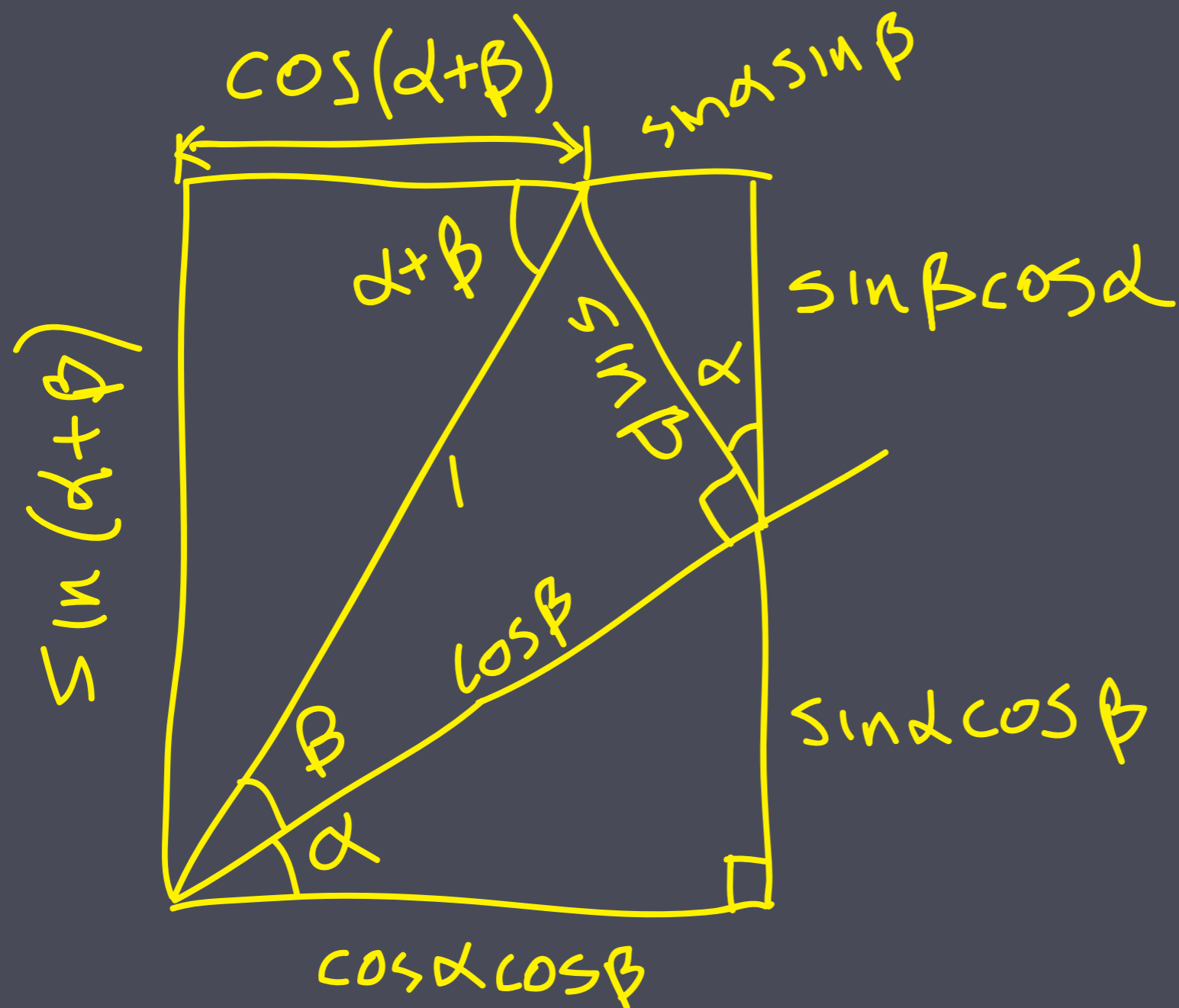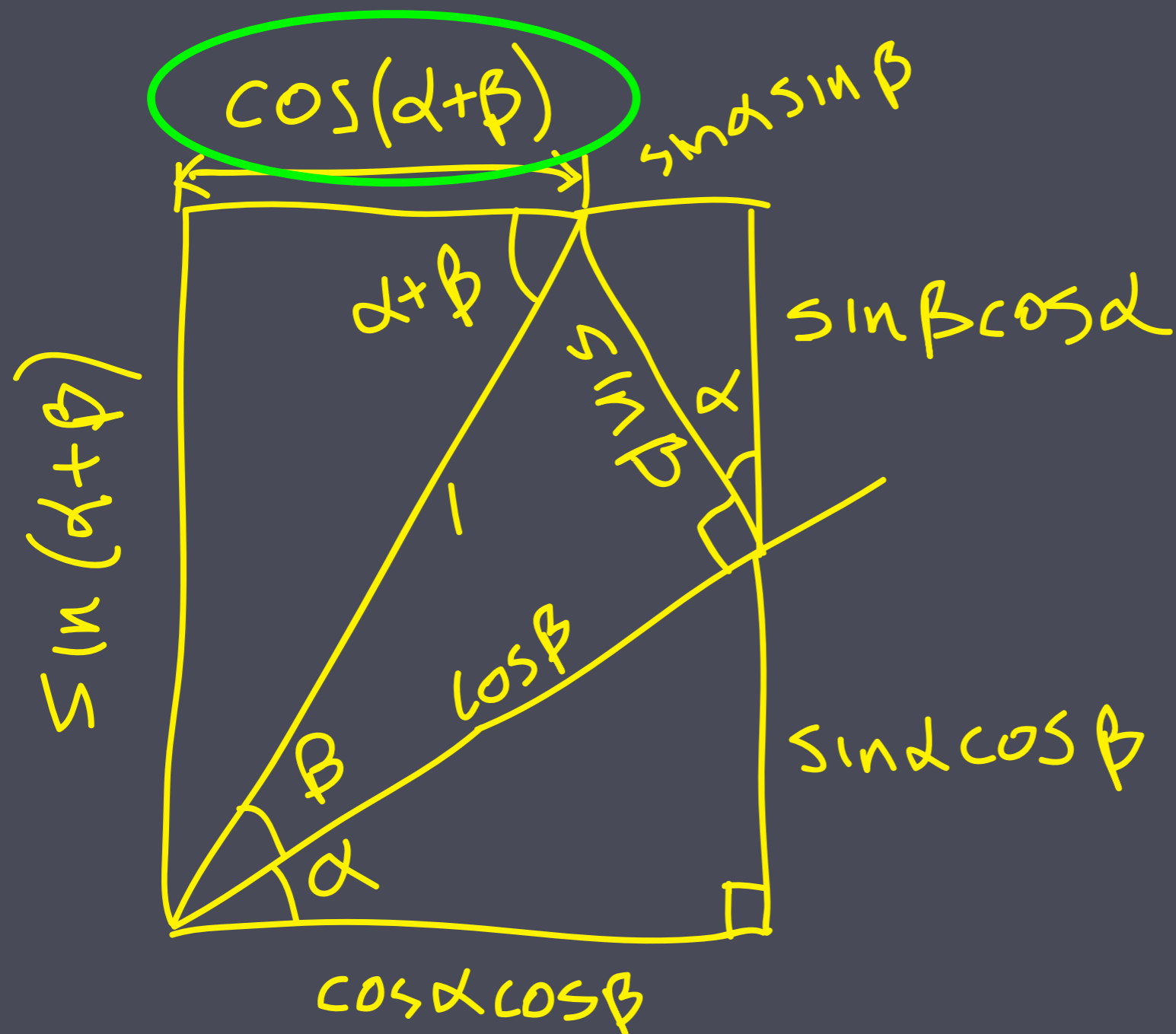
Trig review

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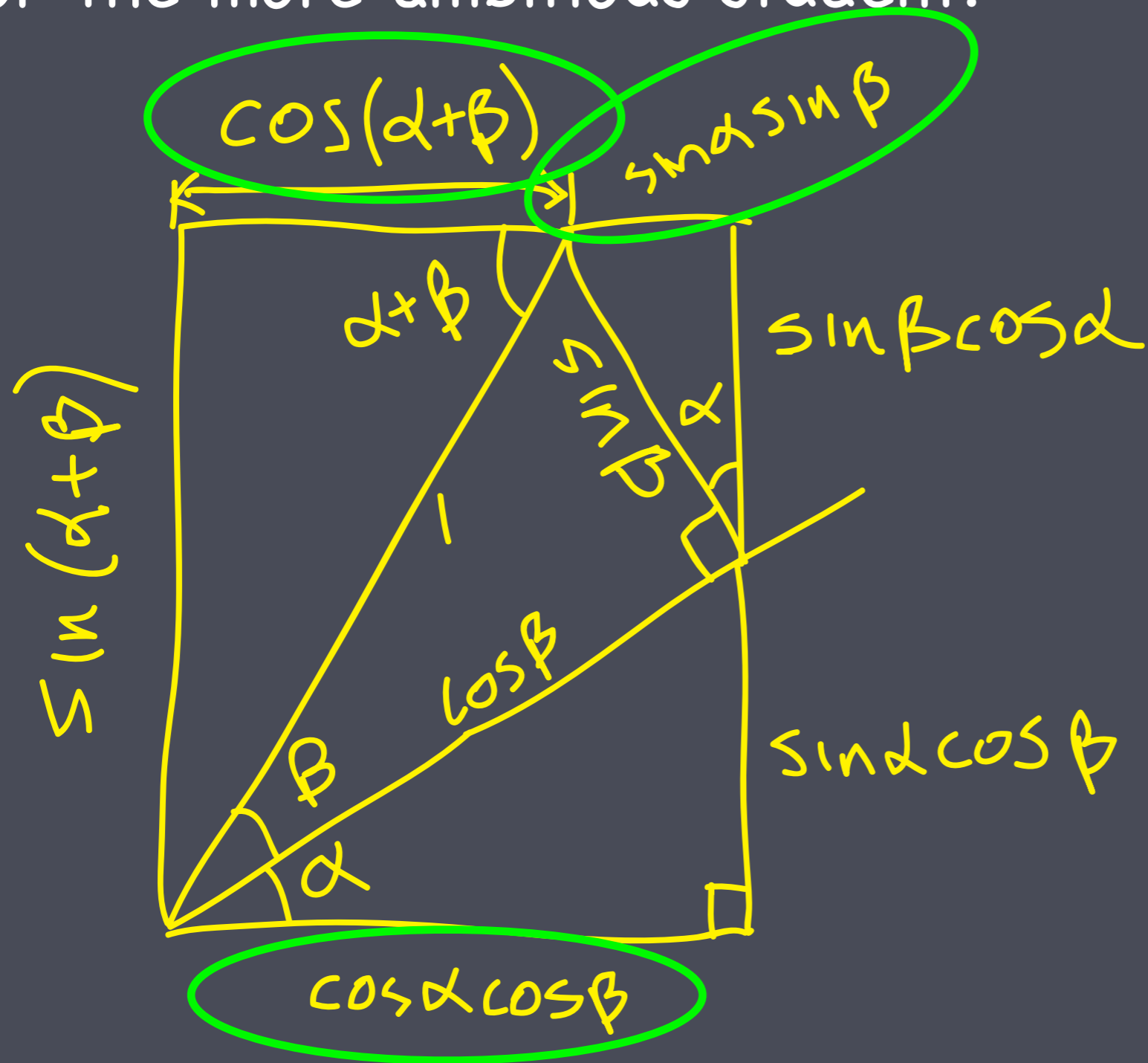# Trig review

For the more ambitious student:

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For the more ambitious student:

$\cos(\alpha+\beta)$

$\sin\alpha\sin\beta$

$\sin\beta\cos\alpha$

$\sin(\alpha+\beta)$

$\alpha+\beta$

$\sin\beta$

1

$\cos\beta$

β

α

$\cos\alpha\cos\beta$

$\sin\alpha\cos\beta$

$\cos(x+y)$

$\qquad = \cos(x)\cos(y) - \sin(x)\sin(y)$

Trig review

For the more ambitious student:

$\sin(x+y)$

$= \sin(x)\cos(y) + \sin(y)\cos(x)$
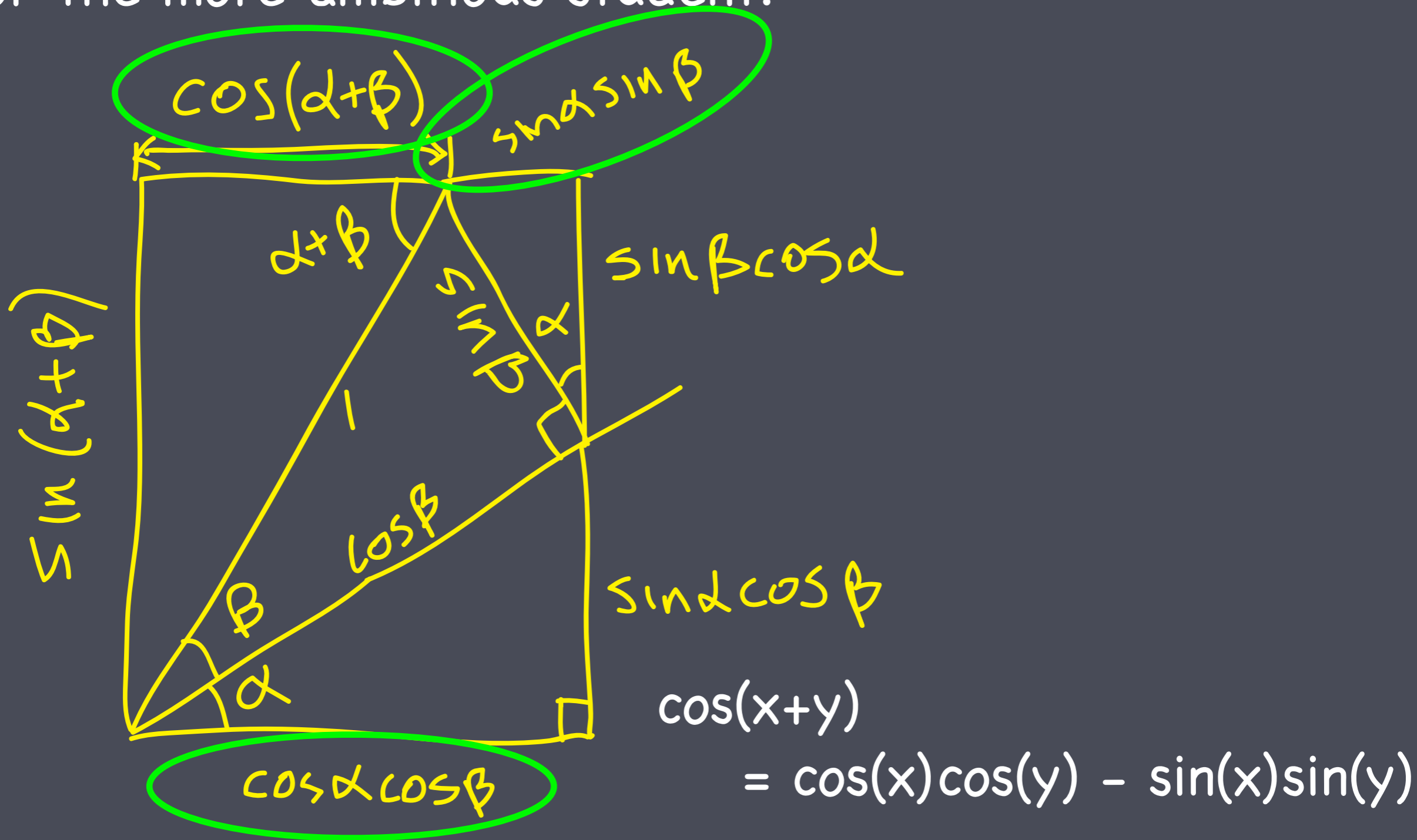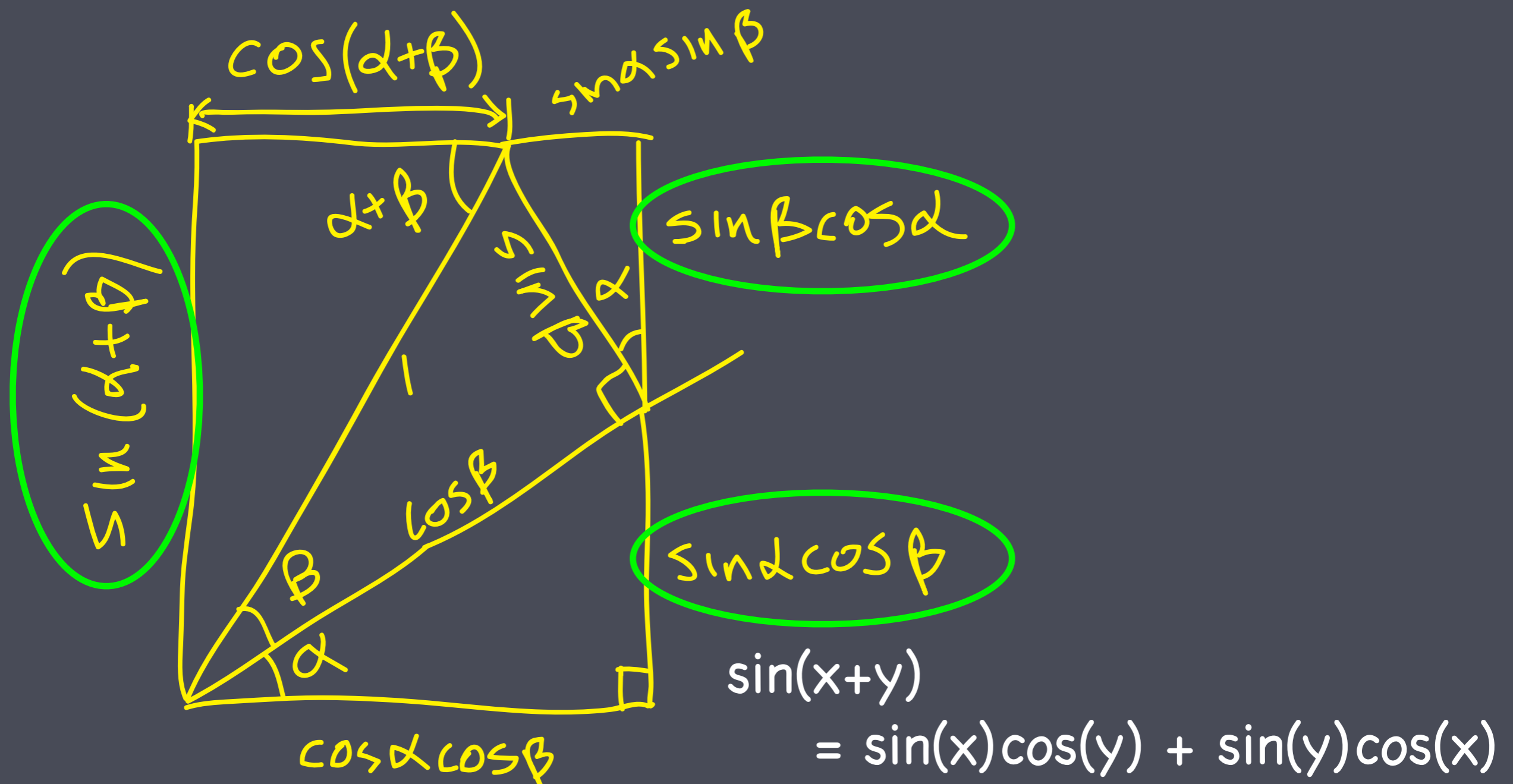
Some trig definitions

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- The amplitude is (max−min)/2. For $f(t)$, it's A.

- The average or midline is (max+min)/2. For $f(t)$, it's M.

- The time-shift is the time at which the argument of the trig function is zero. For $f(t)$, it's D/C. To see this, rewrite it as $f(t) = M + A \sin(C(t-D/C))$.

Trig review

What is the period (T) of $h(t) = 8 - 6\sin(4t+1)$?

    (A) T=4

    (B) T=1

    (C) T=1/4

    (D) T=2π

    (E) T=π/2

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Period of sin(x) is 2π so...

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Period of $\sin(x)$ is 2π so...

⦿ When is $(4t+1)=0$? $t_1=-1/4$

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- When is $(4t+1)=0$? $t_1=-1/4$

- When is $(4t+1)=2\pi$? $t_2=\pi/2-1/4$

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- When is $(4t+1)=0$? $t_1=-1/4$
- When is $(4t+1)=2\pi$? $t_2=\pi/2-1/4$
- $T = t_2-t_1 = \pi/2$.

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- When is (4t+1)=0? t_1=-1/4

- When is (4t+1)=2π? t_2=π/2-1/4

- T = t_2-t_1 = π/2.

- Shift doesn't matter so you can just find T so that 4T=2π.

Trig review

What is the amplitude of $h(t) = 8 - 6\sin(4t+1)$?

(A) 14

(B) 8

(C) 12

(D) 6

(E) −6

Trig review

What is the amplitude of h(t) = 8 – 6sin(4t+1)?

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Trig review

What is the amplitude of h(t) = 8 - 6sin(4t+1)?

(A) 14

(B) 8

(C) 12

(D) 6

(E) -6

h(t) goes from a
low of 8-6 to a
high of 8+6 so the
amplitude is 6.

Trig review

What is the time-shift of h(t) = 8 – 6sin(4t+1)?

(A) –1

(B) –1/4

(C) 4

(D) 4/2π

(E) 1/2π

Trig review

What is the time-shift of h(t) = 8 – 6sin(4t+1)?

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⦿ Rewrite as
h(t)= 8 - 6 sin(4 (t+1/4))
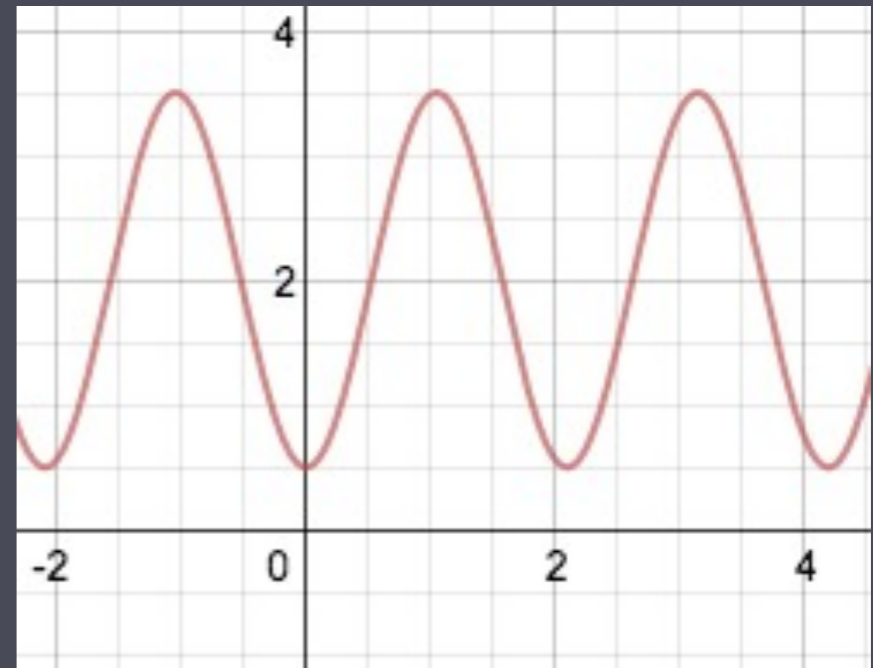to see that h(t) is sin(4t)
shifted by -1/4.

Trig review

What is the time-shift of h(t) = 8 - 6sin(4t+1)?

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- Rewrite as
h(t)= 8 - 6 sin(4 (t+1/4))
to see that h(t) is sin(4t)
shifted by -1/4.

- By some definitions, time-shift
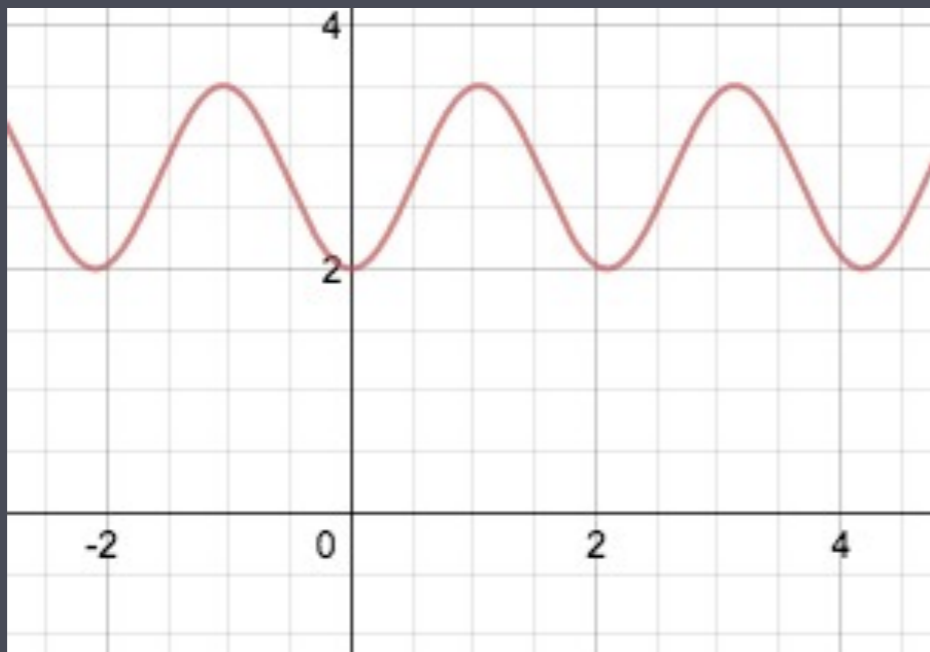is 1/4.

Which is the graph of y = 2 + 1.5 sin(3x−π/2)?

(A)

(B)

(C)
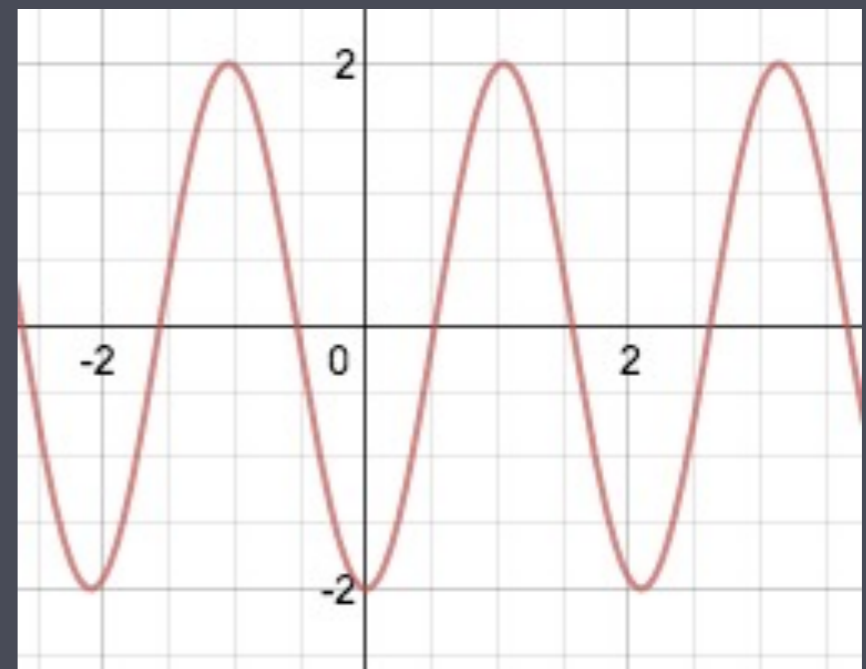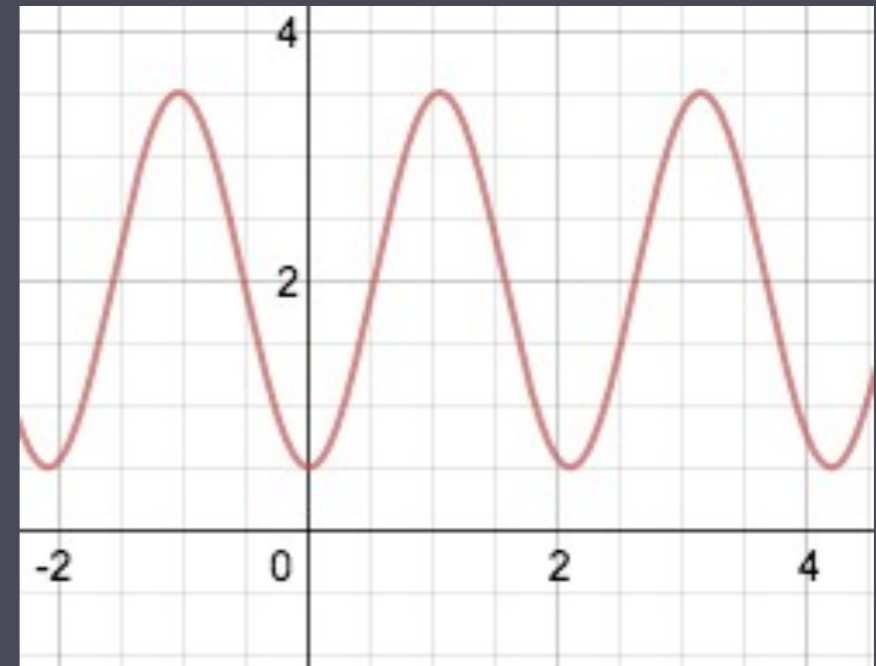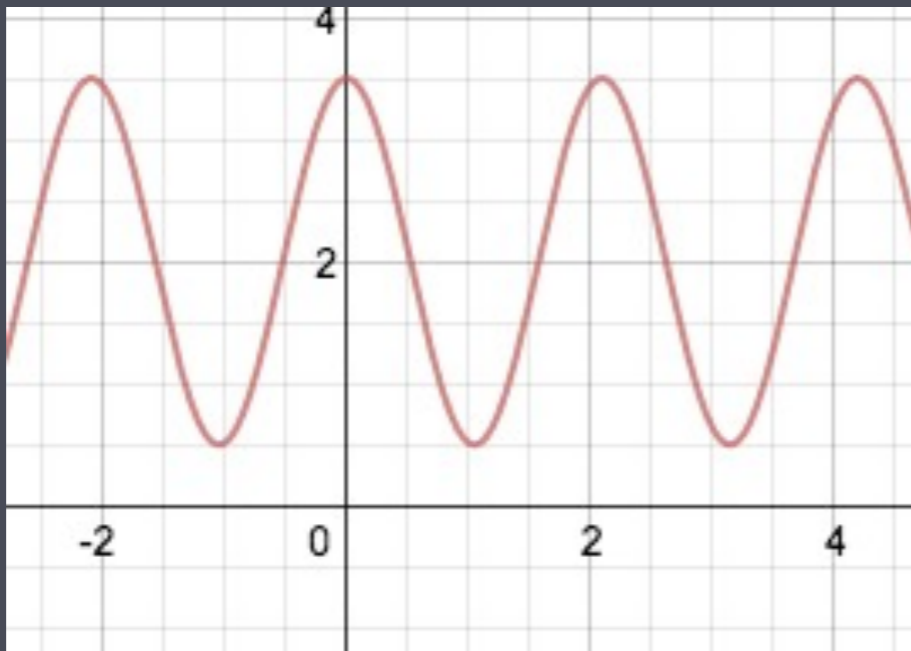
(D)

Which is the graph of y = 2 + 1.5 sin(3x−π/2)?

(A)

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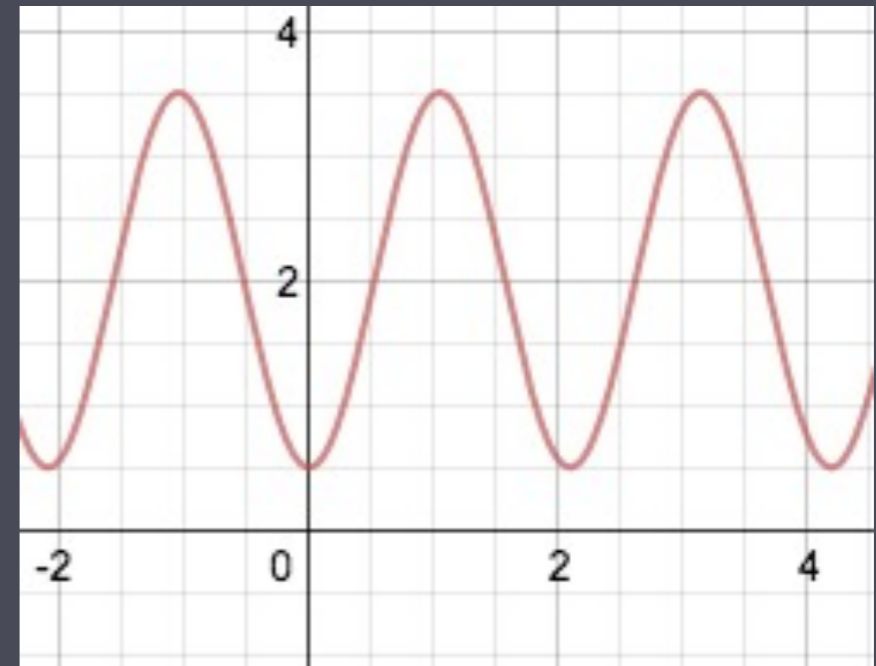y=2+1.5 sin(3(x−π/6))
so this is like sin(3x) shifted
right by π/6.

Which is the graph of y = 2 + 1.5 sin(3x−π/2)?

(A)

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y=2+1.5 sin(3(x−π/6))
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Annual variation in daylight per day in Vancouver (Jan 1 --> t=0)

(A) $L(t) = 12 + 4\cos\left(\dfrac{2\pi}{365}(t - 172)\right)$

(B) $L(t) = 12 + 4\sin\left(\dfrac{2\pi}{365}(t - 172)\right)$

(C) $L(t) = 12 + 4\sin\left(\dfrac{2\pi}{365}(t + 80)\right)$

(D) $L(t) = 12 - 4\sin\left(\dfrac{2\pi}{365}(t - 80)\right)$

Note: t=172 is June 21; t=80 is March 21.

Annual variation in daylight per day in Vancouver (Jan 1 --> t=0)

(A) $L(t) = 12 + 4\cos\left(\dfrac{2\pi}{365}(t - 172)\right)$

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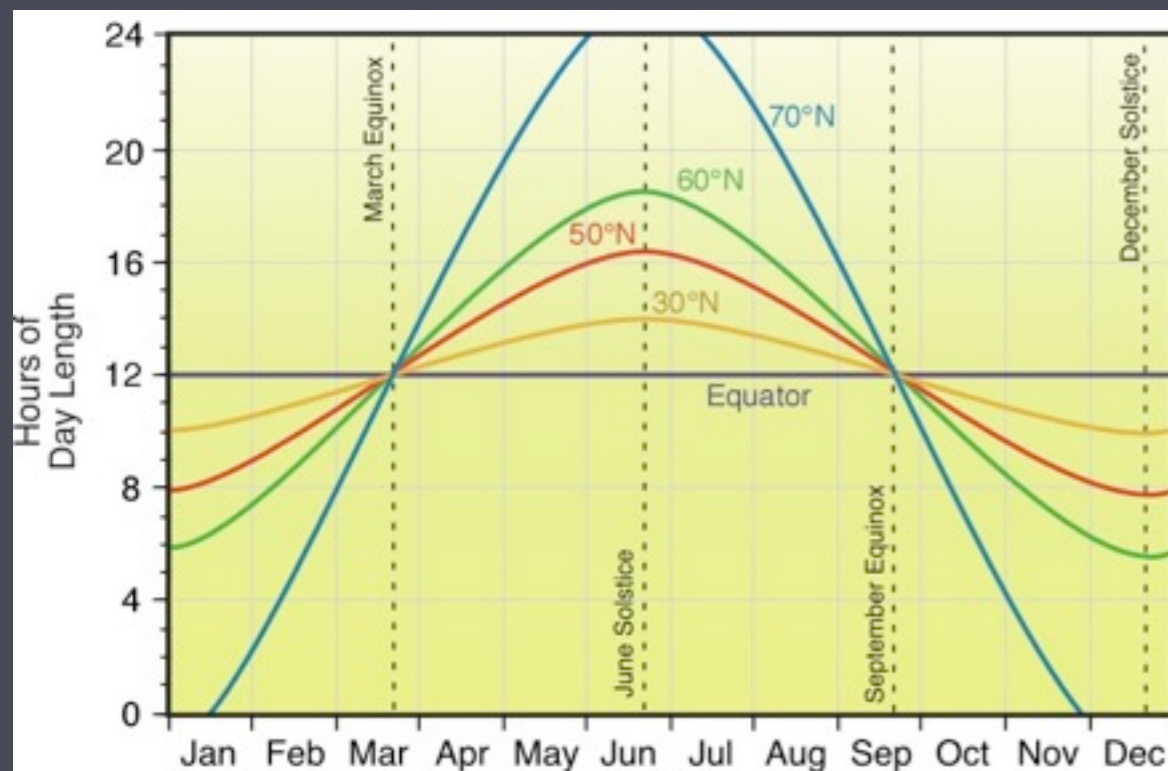
(C) $L(t) = 12 + 4\sin\left(\dfrac{2\pi}{365}(t + 80)\right)$

(D) $L(t) = 12 - 4\sin\left(\dfrac{2\pi}{365}(t - 80)\right)$

Note: t=172 is June 21; t=80 is March 21.

Annual variation in daylight per day in Vancouver (Jan 1 --> t=0)

(A) $$L(t) = 12 + 4\cos\left(\frac{2\pi}{365}(t - 172)\right)$$

$$+ 4\sin\left(\frac{2\pi}{365}(t - 172)\right)$$

$$+ 4\sin\left(\frac{2\pi}{365}(t + 80)\right)$$

$$- 4\sin\left(\frac{2\pi}{365}(t - 80)\right)$$

Note: t=172 is June 21; t=80 is March 21.