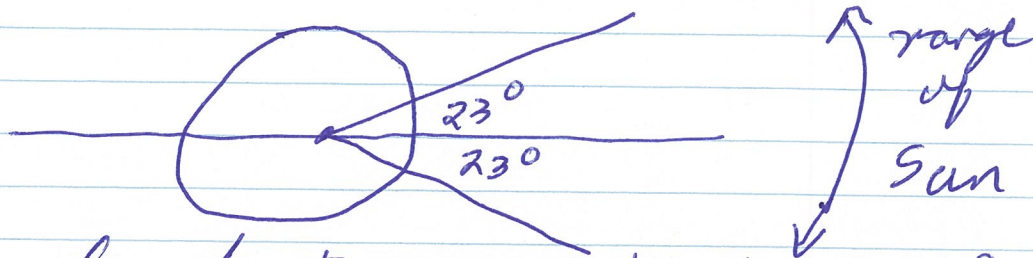


①

Class Assignment #1 Jan 12 2019

1 (a)



Have to be between latitude and -23° (i.e. in tropics).
If between tropics see Sun overhead twice during year.

(b) Today is Jan 12 2019

On Dec 21 Sun was at -23°
and on March 21 Sun at 0°
 $\therefore$ Sun moves 23° in ~ 90 days
or $\sim 0.26^\circ / \text{day}$

Jan 12 is ~ 22 days after
Dec 21 so it has moved.
 $22 \times 0.26^\circ$ North since
winter solstice $\approx 5.6^\circ$
 $\therefore$ Sun is at $\delta = -23 + 5.6$

$\approx -17.4^\circ$
(Actual value ≈ -21.8 - not linear)
Formula $\delta = -23.45 \cos\left(\frac{360}{365}(d+10)\right)$

d = day of year

The +10 comes from winter solstice occurring before start of year.

To get RA of Sun today note
RA $= 0^h$ on March 21 and Sept 21
 $\therefore$ Sun moves through 2^h RA / month

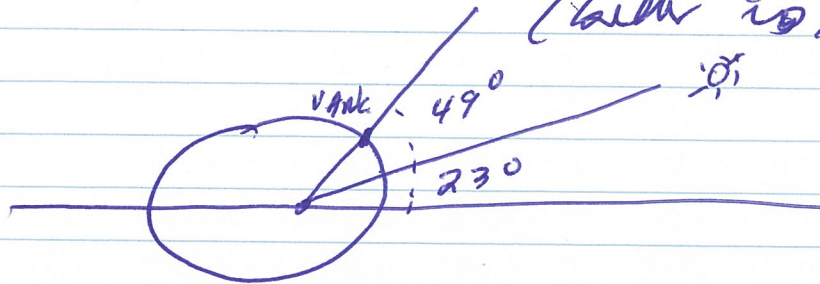
Jan 18 2019 (2)

∴ on Jan 12 (~290 days after March ~~Sept~~ 21) Sun has moved

$$\frac{290}{365} \times 24^h \text{ in RA} \approx 19.1^h$$

∴ RA Sun Jan 12 $\approx 19^h 06^m$
(value is $19^h 38^m$)

(c)



∴ On Summer solstice Sun is
 $49^\circ - 23^\circ$ away from overhead
 $= 26^\circ$

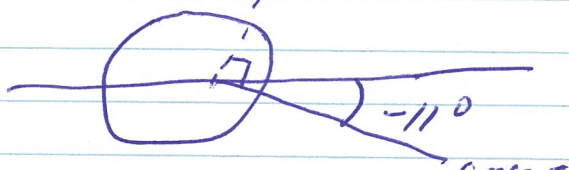
∴ Maximum altitude is $90 - 26 = \underline{\underline{64^\circ}}$

2. (a) CFHT in January RA Sun $\approx 19^h$
we want to be AWAY from Sun
(by about 12^h) → RA from
observing is $\approx 7^h \pm 4$ hours.

(b) CFHT is at a latitude $\approx 19^\circ N$
So we will want to observe at

$\delta \approx -10^\circ$ (this is true all-year
round)

3. $\delta_{\text{spica}} \approx -11^\circ$



if latitude $> 79^\circ$ — definitely above horizon
for Vancouver.

It will be above
the horizon some time
during year for
all latitudes $< 90^\circ$
Never above horizon.

Jan 12 2019. (3)

4. The Sun is as far north as
it ever gets on June 21

So on 21 June it will set
as far to the North of West as it ever ~~does~~.
directly

west on March 21 and Sept 21