

5.1 Intro. to Periodic Functions

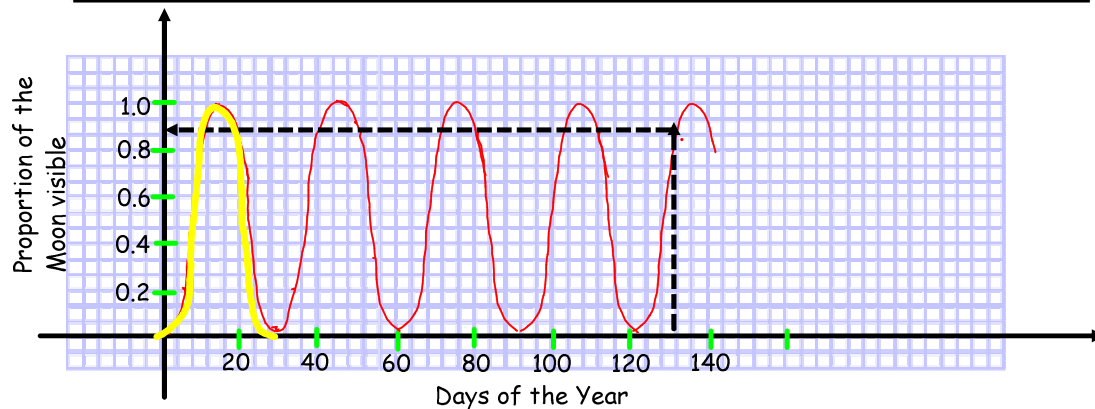
Follow along this is the example on 326-327

Ex 1:

During a year we see different proportions of the Moon and it depends on where it is in its orbit around the Earth.

The table and graph below shows the proportion of the Moon that was visible from Southern Ontario on days 1 to 74 in 2006.

Day of the Year	1	4	7	10	14	20	24	29	34	41	44	48	53	56
Proportion of the Moon Visible	0.02	0.22	0.55	0.83	1	0.73	0.34	0	0.28	0.92	1	0.86	0.41	0.12



What do you notice?

Cycle Repeats every 30 days (approx)

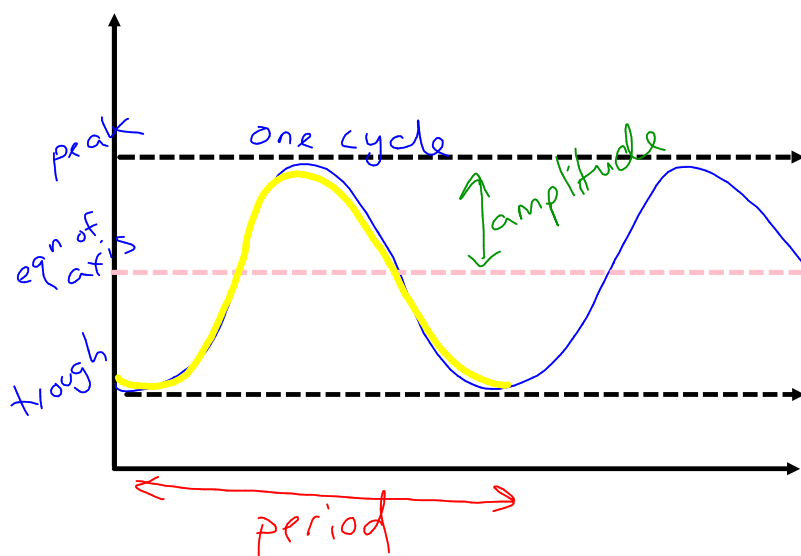
Can we predict the Proportion of the moon that is visible on day 130?

*Yes, because pattern repeats!
∴ approx 90% will be visible*

Read p 324-329 in your text

Define the following:

- Periodic Function
- Period
- Cycle
- Peak
- Trough
- Amplitude
- Equation of the axis

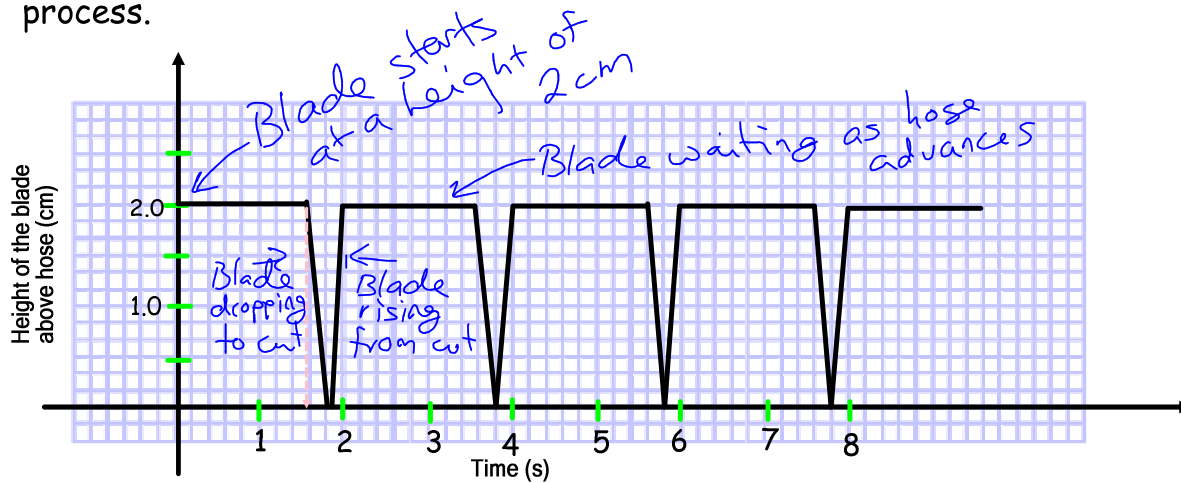


the equation of the horizontal line half way between the peak and the trough

$$y = \frac{\text{peak} + \text{trough}}{2}$$

Ex 2: see p 328 for example

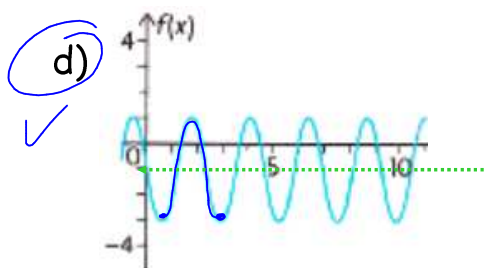
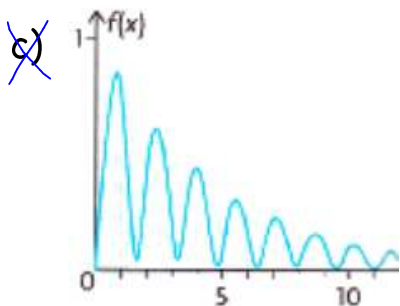
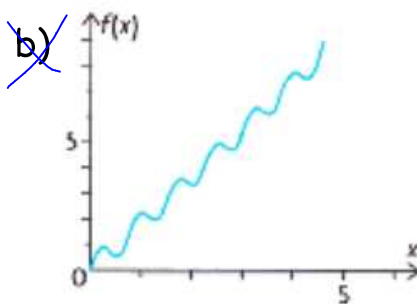
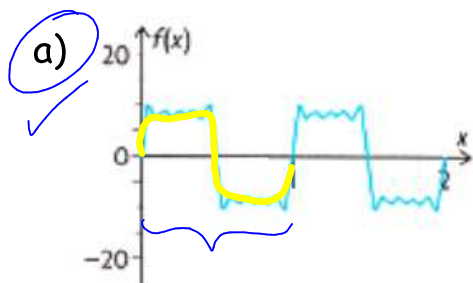
Nancy's mother works at the factory that makes rubber hoses. A chopping machine cuts each hose to 5 m lengths. How can we interpret the graph that shows the process.



1. The cutting action repeats every 2 sec. The period is 2 sec.
2. The maximum height of the blade is 2 cm
3. The minimum height is 0 cm
4. The blade stops for 1.75 sec.
5. The blade takes 0.25 s to go down and up.

Ex 3:

i) Which of the following graphs are periodic?



ii) For each of the above periodic functions

- a) trace one full cycle
- b) state the:

Periodic Function	graph <u>a</u>	graph <u>d</u>
• Period	1	approx 2.2
• Peak	10	1
• trough	-10	-3
• equation of the axis	$y = 0$	$y = -1$
• amplitude	10	2

HMWK:
p 330
1- 4,
(5 and 6)
(and state the
equation of axis)
7-10 ,

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