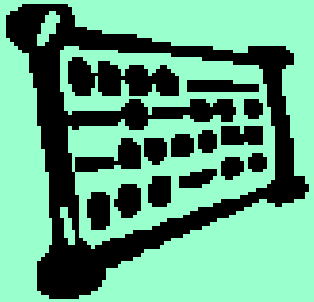
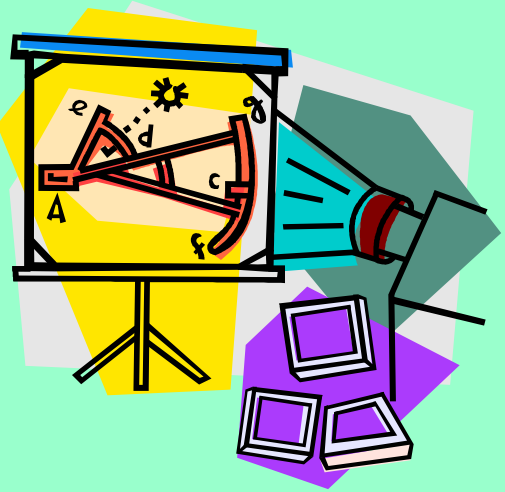
1.

Amplitude and Period for Graphs



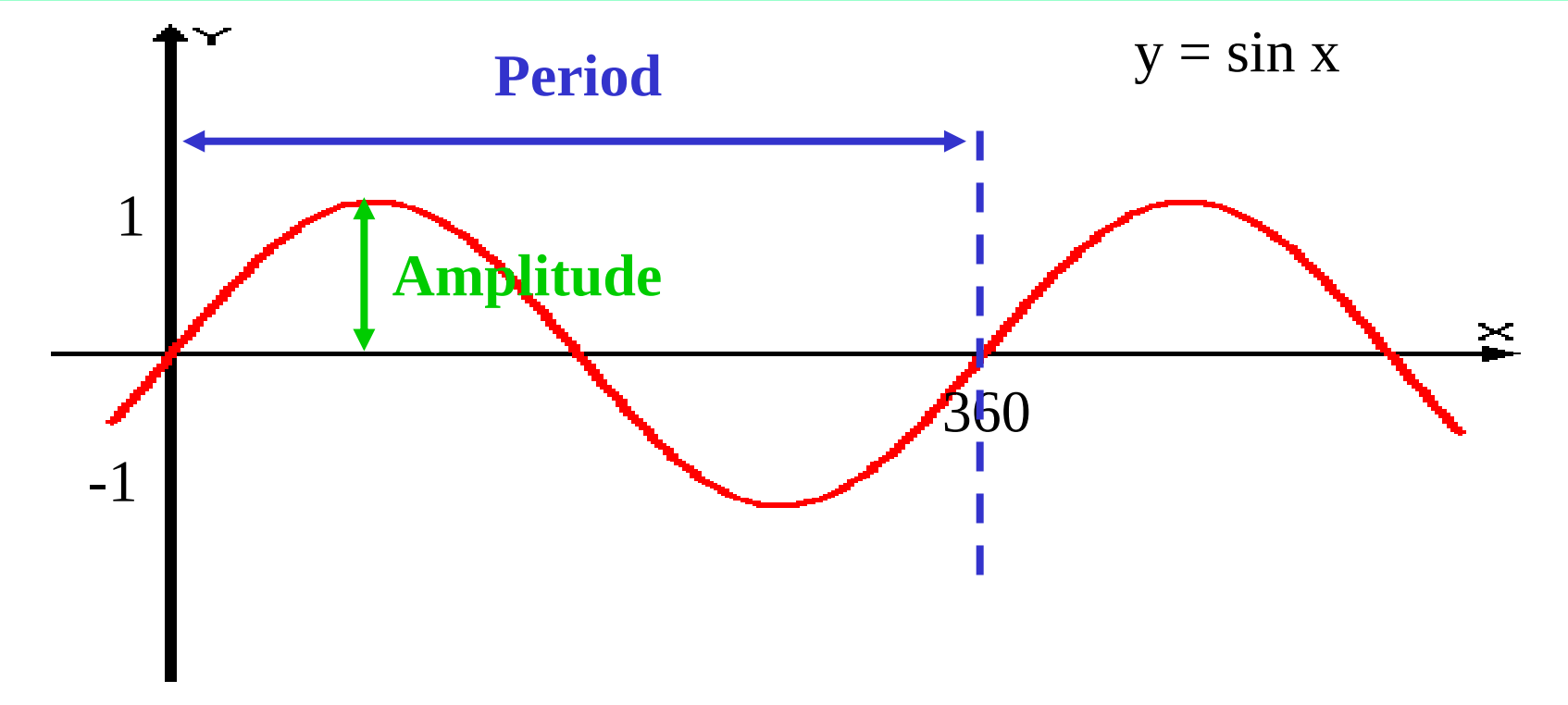


Period and Amplitude

A graph which consists of the same basic pattern repeated over and over is called **periodic**.

The **period** is the horizontal coverage of the basic pattern.

The **amplitude** of a graph is half of its vertical coverage.



Period and Amplitude

Copy the following:

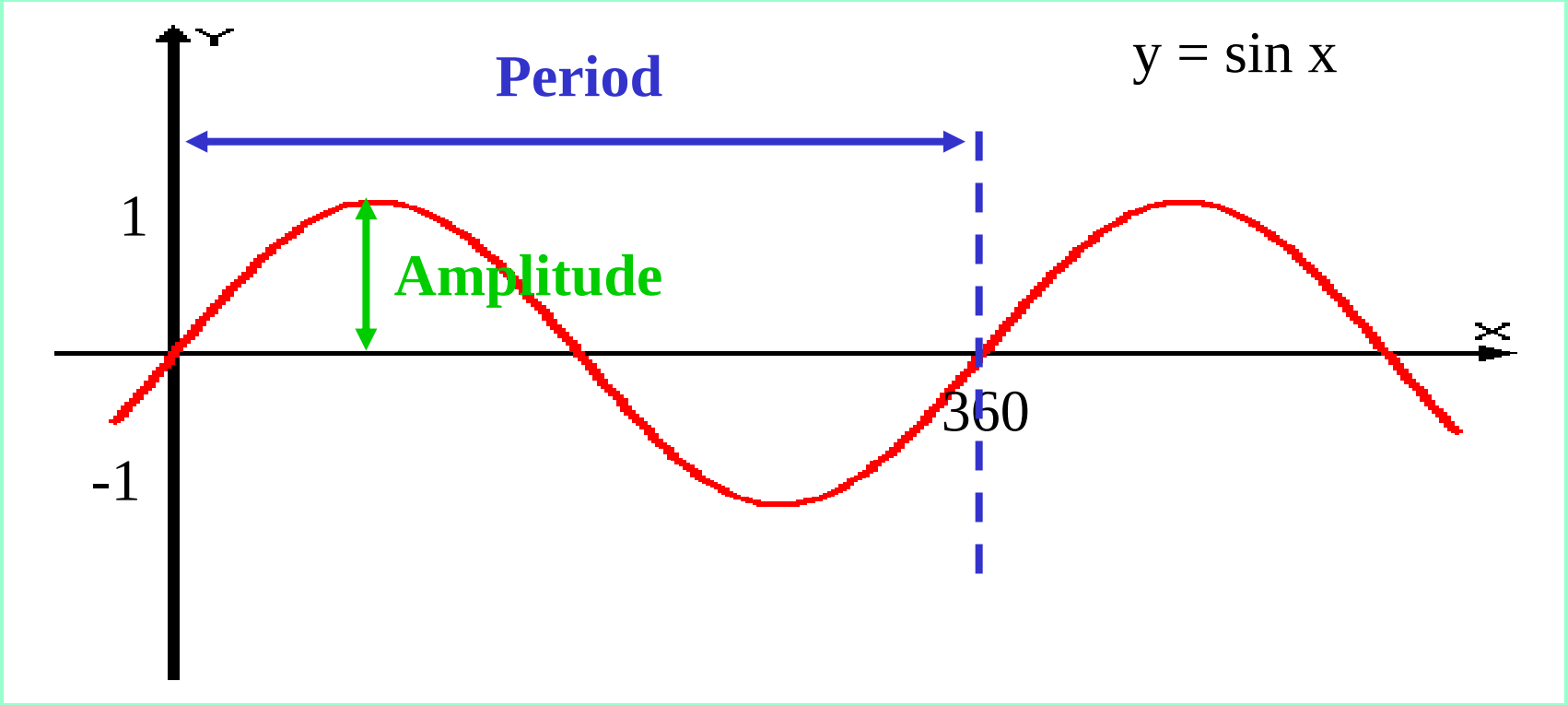
For trig graphs in the form: $y = a\sin bx$ and $y = a\cos bx$

amplitude = stretch factor = a

Period = $\dfrac{360^0}{b}$

"How many complete waves in 360 degrees?"

For y = a tan bx, amplitude is undefined but period = $\dfrac{180^0}{b}$



Heinemann, p.53, EX 4A
(ORALLY)

Graphing trig functions

Recall the rules for transforming graphs.

The same rules apply for trig graphs:

Graph	X-coord	Y-coord	Comment
$y = f(x) \pm a$	No change	$\pm a$	Graph moves vertically up or down by a.
$y = f(x \pm a)$	$\pm a$	No change	Graph moves left **(+)** or right **(-)** by a.
$y = -f(x)$	No change	Change sign	Graph reflected in x-axis
$y = f(-x)$	Change sign	No change	Graph reflected in y-axis.
$y = kf(x)$	No change	Multiply by k	Graph stretched vertically
$y = f(kx)$	Divide by k.	No change	Graph compressed horizontally

Graphing trig functions

Example 1

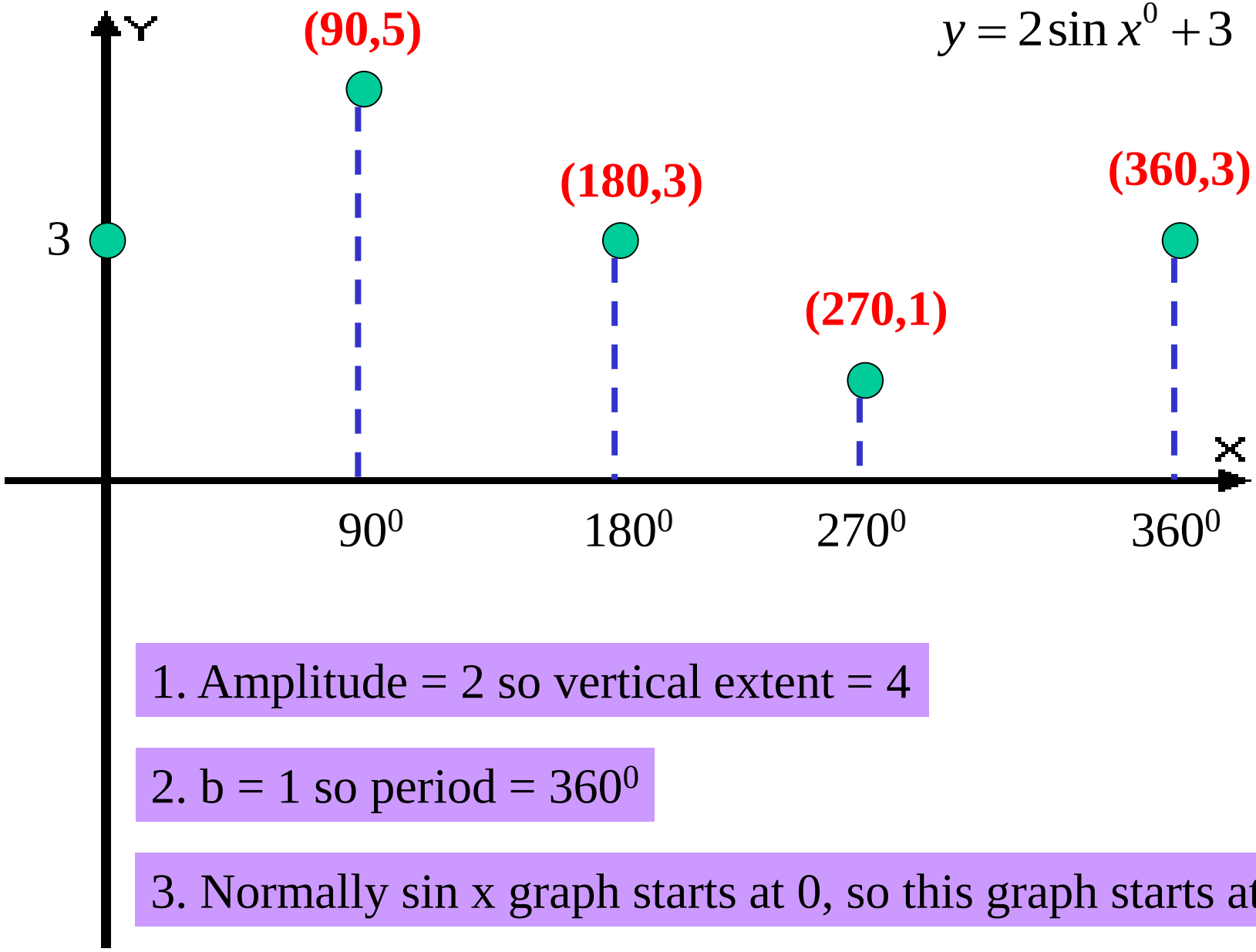
Sketch and annotate the graph of $y = 2\sin x^0 + 3$ $\quad 0 \le x \le 360$

Solution:

1. Amplitude = 2 so vertical extent = 4

2. b = 1 so period = 360^0

3. Normally sin x graph starts at 0, so this graph starts at +3.



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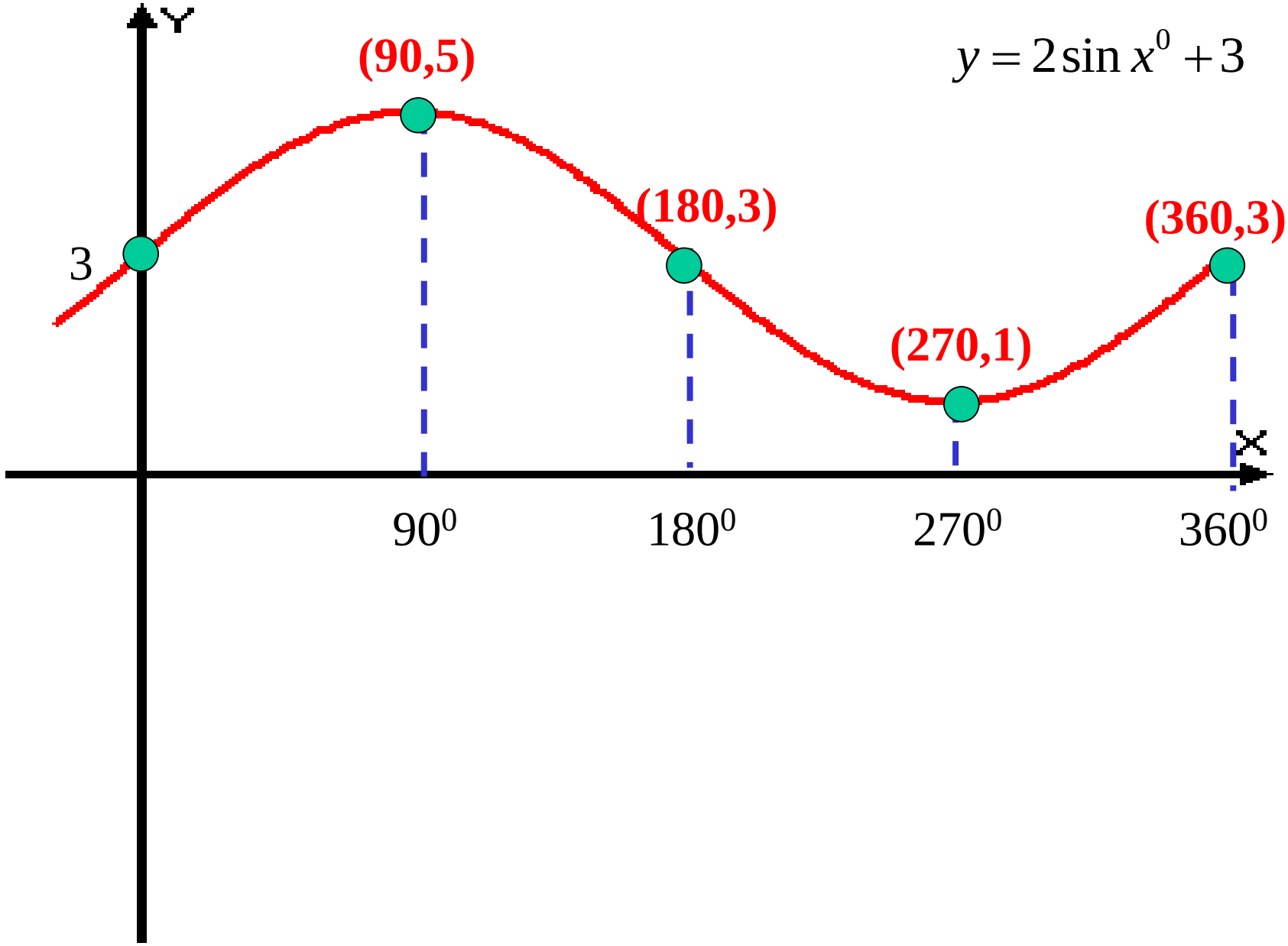
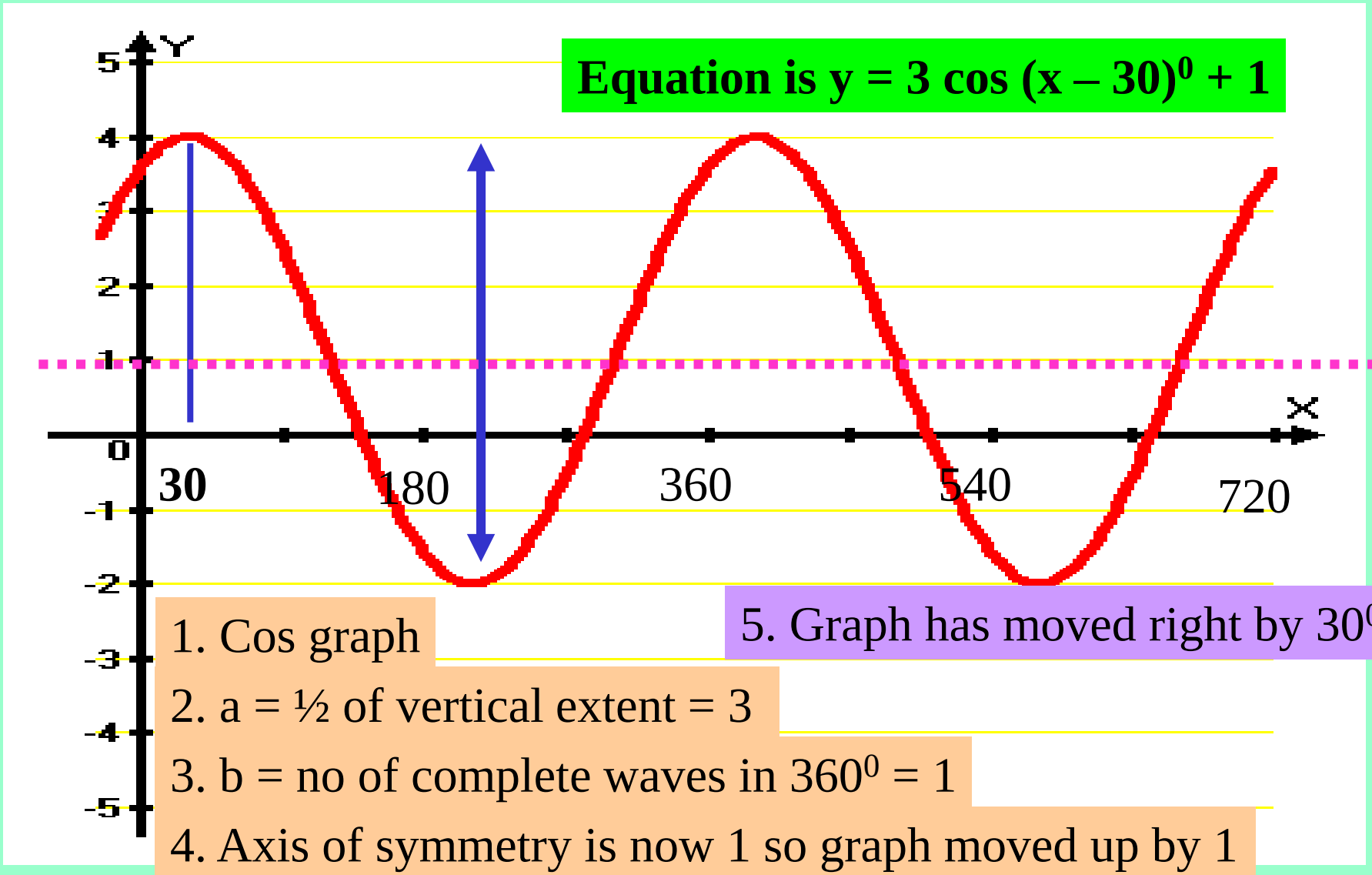

Y
X
(90,5)
(180,3)
(270,1)
(360,3)
3
90⁰
180⁰
270⁰
360⁰
y = 2 sin x⁰ + 3

Example 2

Write a trig function represented by this graph:



Equation is $y = 3 \cos (x - 30)^0 + 1$

1. Cos graph
2. a = ½ of vertical extent = 3
3. b = no of complete waves in $360^0 = 1$
4. Axis of symmetry is now 1 so graph moved up by 1
5. Graph has moved right by 30^0

Heinemann, p.54, EX 4B
Q1 & Q3