Name: …… Date: ……..

Numerical Reasoning _ Equation of a line

Assessment Criterion: A and C

1. A straight line with gradient 6 passes through the point (3, 18).

Find the equation of the line in the form y=m x+ c.

Gradient = 6

Equation of the line is

$y = mx + c$

$y = 6x + c$

To find 'c' use (3, 18)

$18 = 6(3) + c$

$18 = 18 + c$

$c = 18 - 18$

$c = 0$

∴ Equation of the line is

$y = 6x$

2. Circle the equation of the line that is parallel to the x axis

$y = -6$	$x = 6$	$x + y = 3$

3. A straight line has gradient 5 and passes through the point (3, 16)

A student claims that equation of a line is y=5x+3.

Verify if the student's statement is correct or not.

Gradient = 5

Equation of a line is

$y = mx + c$

$y = 5x + c$

To find 'c' use (3, 16)

$16 = 5(3) + c$

$16 = 15 + c$

$c = 16 - 15$

$c = 1$

∴ Equation of a line is

$y = 5x - 1$

From the above result, student claim is incorrect.

4. Match each equation with gradient and y intercept:

	Equation of a line		Gradient & Y intercept
I	$y = 3x$	a)	Gradient is 0.3 & y intercept is 7
II	$y = 3x - 5$	b)	Gradient is 3 & y intercept is -5
III	$y = 0.3x + 7$	c)	Gradient is 3 & y intercept is 0

I - b, II - C ; III - a

5. A phone plan charges a fixed monthly fee plus a cost per gigabyte of data used. A customer who uses 5 GB pays 650 THB, while a customer who uses 10 GB pays 900 THB.

a) Calculate the gradient (THB per GB)?

(5, 650) (10, 900)

$$\text{Gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{900 - 650}{10 - 5}$$

$$= \frac{250}{5}$$

Gradient = 50 THB per GB

b) Write the linear cost model $C(x)$?

$C(x) = mx + b$

Where m = cost per GB (gradient)

b = Base monthly fee (y intercept)

Linear model is

Cost Model $= 50x + C$

To find 'c' value use (5, 650)

$650 = 50(5) + C$

$650 = 250 + C$

$650 - 250 = C$

$C = 400$

y intercept is 400 THB

$C(x) = mx + b$

$C(x) = 50x + 400$

c) How much would 15 GB cost?

$C(x) = 50x + 400$

$C(15) = 50(15) + 400$

$= 750 + 400$

$C(15) = 1150$ THB.