



OPEN SCHOOL BC

Provincial Exam Preparation

Principles of Math 12

$$(x + 3)^2 - (y - 1)^2 = 16$$

$$\cos \frac{2\pi}{3}$$

Helping teachers teach and students learn

Principles of Mathematics 12

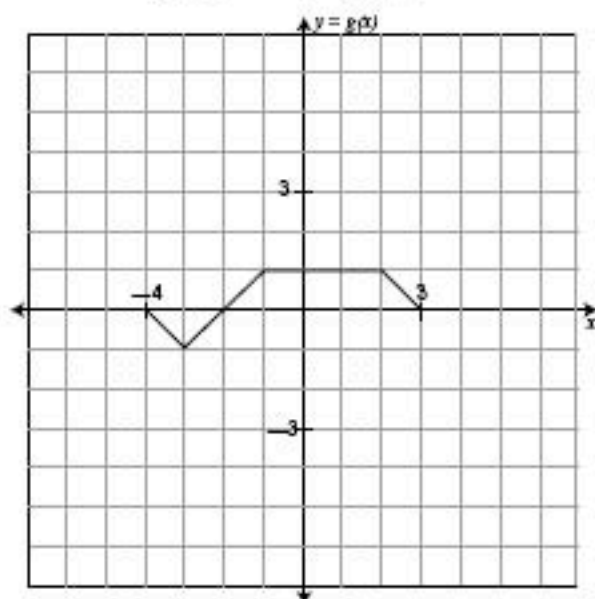
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Test 1: Functions and Conic Relations

Part I: Multiple Choice Questions (1.5 marks each)

Circle the letter of the correct response in each of the following questions.

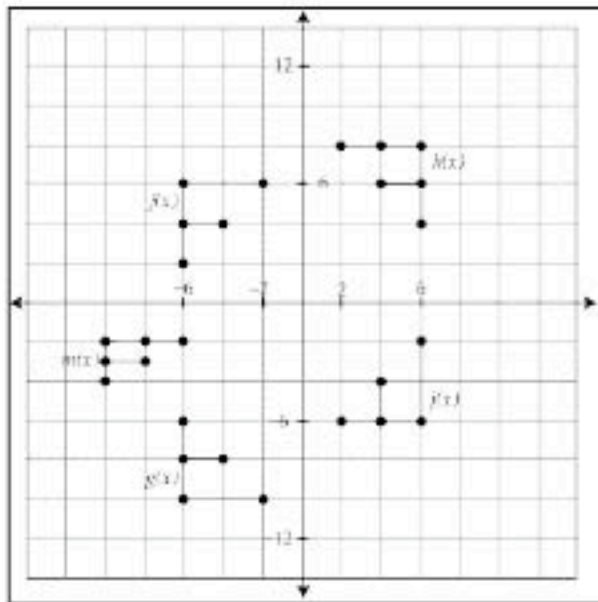
1. Given the graph of $y = g(x)$:



Which of the choices below represents the graph of $y = g(2x)$?

Part II: Written Response Questions

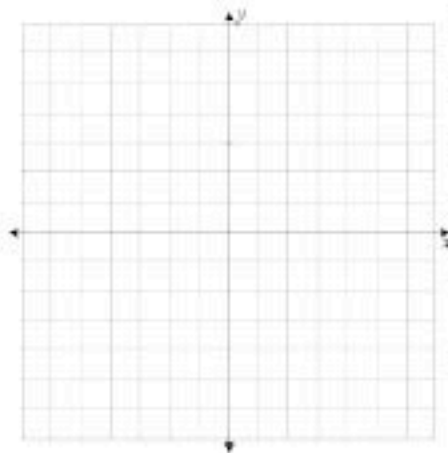
1.



Each of the relations $g(x)$, $h(x)$, $f(x)$, and $m(x)$ are transformations of the relation $f(x)$. Write the equations for these functions in terms of $f(x)$. (4 marks)

2. Sketch the graphs of each of the following. State the value(s) of their intercepts and asymptotes (if any) along with their domain and range. (8 marks)

a) $f(x) = \frac{-2}{x^2 + 1}$



x-intercept(s): _____

y-intercept(s): _____

Horizontal Asymptote(s): _____

Vertical Asymptote(s): _____

Domain: _____

Range: _____

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Test 2: Trigonometry

Part I: Multiple Choice Questions (1.5 marks each)

Circle the letter of the correct response in each of the following questions:

- Determine the approximate value of $\cos 2.7$.
 - 0.904
 - 0.427
 - 0.427
 - 0.904
- If $\sin \theta < 0$ and $\cos \theta > 0$ then the angle θ , in standard position, must terminate in Quadrant:
 - I
 - II
 - III
 - IV
- The point (p, q) is the point of intersection of the terminal arm of angle θ , in standard position, and the unit circle centred at the origin. Determine the value of $\sin \theta$.
 - p
 - q
 - $\frac{p+q}{2}$
 - $\frac{p-q}{2}$

-
- b) Write an equation that expresses your height as a function of the elapsed time. Use sine.
- c) Estimate your height above ground after 53 seconds.
- d) After how many seconds will you reach a height of 45 m for the first time? (correct to 2 decimal places)

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If time permits, please reread your work and add your initials below.

I REREAD MY WORK:

Student's Initials _____

N/2002/09
C/2006/02

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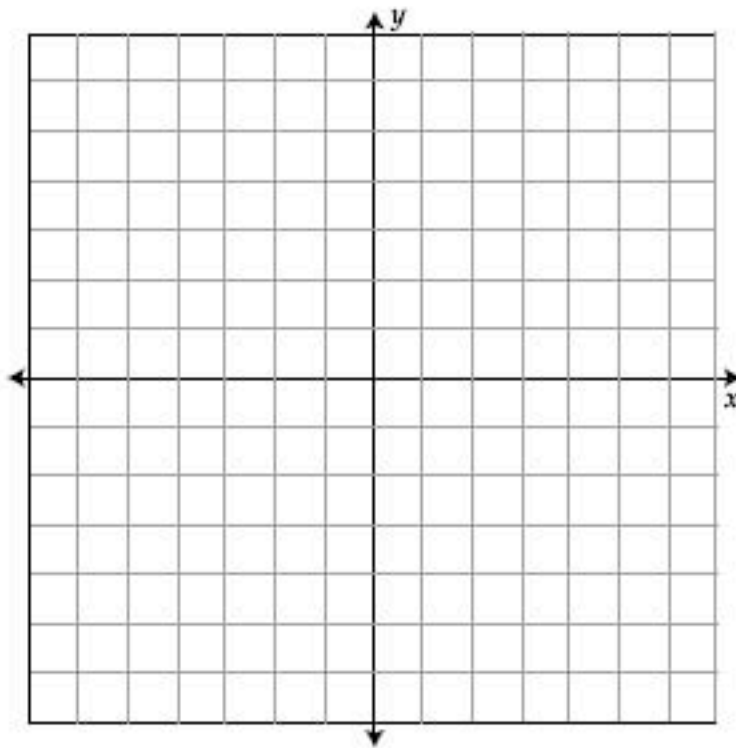
Test 3: Exponential Functions and Series

Part I: Multiple Choice Questions (1.5 marks each)

Circle the letter of the correct response in each of the following.

- Several layers of glass are stacked together. Each layer reduces the light passing through it by 3.5%. About how many panes must be stacked before only 50% of the light passes through?
 - 11
 - 14
 - 19
 - 23
- If you invest \$2500 at 8% compounded semi-annually, how much will you have after seven years?
 - \$4329
 - \$4285
 - \$3701
 - \$3463
- The population of a certain highschool is currently 1750 students and it is decreasing by 4% each year. Which expression represents the population, P , of the school five years from now?
 - $P = 1750(1.04)^5$
 - $P = 1750(1.04)^{-5}$
 - $P = 1750(0.96)^{-5}$
 - $P = 1750(0.96)^5$

5. Sketch the graph of the function $y = \log_4(x + 6) - 1$, labelling any asymptote with its equation. (4 marks)



- a) Determine the x-intercept(s).
- b) Determine the y-intercept, correct to two decimal places.

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If time permits, please reread your work and add your initials below.

I REREAD MY WORK:

Student's Initials _____

N/02/09

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Test 4: Probability and Statistics

Part I: Multiple Choice Questions (1.5 marks each)

Circle the letter of the correct response in each of the following questions:

1. A student has a choice of five different computers, three different monitors, and seven different printers. How many different computer systems are possible?
 - a) 15
 - b) 56
 - c) 105
 - d) 128

2. A combination lock has fifty numbers on its dial. In order to open it, the dials must be turned first to the right, then left, then right again—with three selected numbers. This process is an example of a:
 - a) permutation
 - b) combination
 - c) both permutation and combination
 - d) neither permutation nor combination

Part II: Written Response Questions (34 marks)

Instructions: Show all steps in your solutions. If you use a graphing calculator, indicate that in your solution.

1. Solve for n . Show all steps in your solution. (4 marks)

$${}_n P_2 = 110$$

2. Point B is five blocks east and three blocks north of point A. Point C is three blocks east and four blocks north of point B. How many paths are there from point A to point C? (3 marks)

Part II: Written Response Questions (20 marks)

1. Prove algebraically $\frac{\cos 2x - 1}{\sin 2x} = -\tan x$. (5 marks)

Left Side	Right Side
$\frac{\cos 2x - 1}{\sin 2x}$	$-\tan x$
$\frac{1 - 2\sin^2 x - 1}{2\sin x \cos x}$	$\frac{-\sin x}{\cos x}$
$\frac{-2\sin^2 x}{2\sin x \cos x}$	
$\frac{-\sin x}{\cos x}$	

Left Side = Right Side

2. Solve for x , algebraically. $0 \leq x < 2\pi$. Give your answer(s) correct to two decimal places. (5 marks)

$$3\cos^2 x + 2\cos x = 1$$

Solution: $3\cos^2 x + 2\cos x - 1 = 0$

$$\cos x = \frac{-2 \pm \sqrt{2^2 - 4(3)(-1)}}{6}$$

$$= \frac{-2 \pm 4}{6}$$

$$= -1 \text{ or } \frac{1}{3} = 0.333$$

If $\cos x = -1$, $x = \pi(3.14)$

If $\cos x = 0.333$, reference angle = $\cos^{-1}(0.333) = 1.23$

$\therefore x = 1.23(QI)$ or $5.05(QIV)$

Solution: 1.23, 3.14, 5.05