

Senior Cycle Multiple Choice Mathematics Test (Higher Level)

- ✓ Please indicate your answer by placing an ✕ over the letter of your choice as shown.
- ✓ You should indicate one answer for each question.
- ✓ If you make a mistake and wish to change your answer, please place the incorrect selection in brackets [✕] and ✕ your revised choice.
- ✓ Calculator use is not permitted.
- ✓ Please show all your work.

School:	Class:
Date Administered:	Administered by:
Date Corrected :	Date Analysed:

Student Name :	
DOB :	AGE:

Exams can be marked using a four point category scale that is used by the State Examinations Commission. The total number of marks per question can be altered dependent upon the agreed marking scheme of individual school's mathematics departments. A spreadsheet is available to help analyse the results at: <http://www.pdst.ie/node/2879>

Out of a total of 10 marks for each question, award marks as following:
0 marks- response of no substantial merit **or** correct response with no work shown.
3 marks- response with some merit
7 marks- almost correct response
10 marks- correct response with work shown.

Question 1

f is a function defined for all real numbers such that $f(x) = \frac{2-x}{x-2}$, except for when $x = 2$. Then $f\left(-\frac{1}{3}\right)$ is

(a) 1

(b) -1

(c) $\frac{2}{3}$

(d) $-\frac{3}{2}$

Show all work

Question 2

$p(0,7), q(7,0), r(4,4)$ and $s\left(3\frac{1}{2}, 3\frac{1}{2}\right)$ are our points. Three of them lie on the same straight line. The odd one out is?

(a) p

(b) q

(c) r

(d) s

Show all work

Question 3

A line through the origin perpendicular to $4x - 5y - 9 = 0$ is

- (a) $4x - 5y = 0$ (b) $5x = -4y$ (c) $5x + 4y - 1 = 0$ (d) $4x + 5y = 0$

Show all work

Question 4

$16^{-\frac{3}{4}}$ is

- (a) -8 (b) -12 (c) $\frac{1}{8}$ (d) $-\frac{4}{3}$

Show all work

Question 5

The mean of 7 numbers is 10. When another number is added the mean is reduced to $9\frac{1}{2}$. The new number is

- (a) 10 (b) $\frac{10}{7}$ (c) $9\frac{1}{2}$ (d) 6

Show all work

Question 6

If $a \oplus b = \frac{2a - 3b}{3}$, then

- (a) $1 \oplus 2 = \frac{1}{3}$ (b) $3 \oplus 2 = \frac{3}{4}$ (c) $1 \oplus -2 = 0$ (d) $6 \oplus 6 = -2$

Show all work

Question 7

r and s are roots (i.e. satisfy) the equation $3x^2 + x - 10 = 0$. Then $(r+s) =$

(a) $\frac{2}{3}$

(b) $-\frac{1}{6}$

(c) $\frac{1}{3}$

(d) $-\frac{1}{3}$

Show all work

Question 8

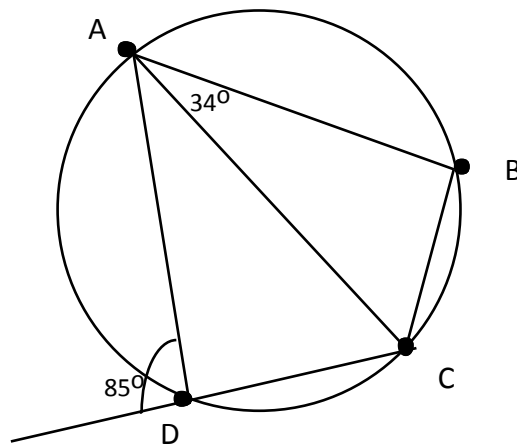
In the diagram $|\angle ACB| =$

(a) 51°

(b) 56°

(c) 61°

(d) 60°



Show all work

Question 9

Diesel costs s cent per litre while unleaded petrol costs 3 pence per litre more than diesel. How many cents does u litres of unleaded cost?

(a) $u(s+3)$

(b) $s+3$

(c) $s-3$

(d) $us-3$

Show all work

Question 10

Two dice are thrown and the scores added. What's the most likely total?

(a) 6

(b) 7

(c) 9

(d) 12

Show all work

Question 11

If $\frac{2}{x} + \frac{2}{y} - \frac{4}{z} = 0$, then

(a) $y = \frac{2x-z}{zx}$

(b) $y = \frac{4x-2z}{zx}$

(c) $y = \frac{zx}{z-2x}$

(d) $y = \frac{zx}{2x-z}$

Show all work

Question 12

If the roots of $x^2 - 3x + w = 0$ are natural numbers, then w could have a value of

(a) -8

(b) 2

(c) -4

(d) 4

Show all work

Question 13

On a pie chart representing the numbers of students in a school, first year students are represented by an angle of x° . If there are 100 students in first year and 750 students in total in the school, then:-

(a) $x = \frac{360}{7.5}$

(b) $x = 52$

(c) $x = \frac{750 \times 100}{360}$

(d) $x = \frac{360}{750}$

Show all work

Question 14

If $x^3 = \frac{1}{125}$ then

- (a) $x = 5$ (b) $x = 0.5$ (c) $x = 0.2$ (d) $x = -5$

Show all work

Question 15

The statement $x^2 > x$ is

- (a) Always true (b) Only true if x is positive
(c) False if x is a proper fraction
(d) Always true if x is a natural number

Show all work

Question 16

$(0.1)^2 \times 1000$ is:-

(a) 0.1

(b) 1

(c) 10

(d) $\frac{1}{100}$

Show all work

Question 17

60% of a number is $\frac{x}{2}$, then 40% of the same number is:-

(a) $\frac{2x}{5}$

(b) $\frac{3x}{4}$

(c) $\frac{3x}{25}$

(d) $\frac{x}{3}$

Show all work

Question 18

700 cm³ in litres is:-

- (a) 7 (b) $\frac{7}{10}$ (c) 0.007 (d) 700

Show all work

Question 19

If $p : 4 = 3 : q$ then:-

- (a) $3p = 4q$ (b) $\frac{1}{3}p = \frac{1}{4}q$ (c) $\frac{1}{4}p = \frac{1}{3}q$ (d) $pq = 12$

Show all work

Question 20

$$\frac{1}{2} + \frac{1}{4} \times \frac{3}{4} =$$

(a) $\frac{1}{2}$

(b) $\frac{3}{2}$

(c) $\frac{9}{16}$

(d) $\frac{11}{16}$

Show all work

Question 21

The factors of $x^2 + y^2$ are

(a) $(x+y)(x-y)$ (b) $(x+y)(x+y)$ (c) $(x-y)(x-y)$ (d) *none of these*

Show all work

Question 22

0.0146 expressed in the form $a \times 10^n$ where $1 \leq a < 10$

- (a) 0.146×10^{-1} (b) 1.46×10^{-2} (c) 0.146×10^{-3} (d) 14.6×10^{-3}

Show all work

Question 23

If A is an acute angle and $\sin A = \frac{1}{2}$, then

- (a) $\tan A = \frac{1}{\sqrt{3}}$ (b) $\cos A = \frac{1}{2}$ (c) $\tan A = \sqrt{3}$ (d) 14.6×10^{-3}

Show all work

Question 24

The slope of a line perpendicular to the line containing $(0,3)$ and $(-2,0)$ is

- (a) $-\frac{2}{3}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) $-\frac{3}{2}$

Show all work

Question 25

How many numbers from 1 to 100 have the figure '5' in them?

- (a) 5 (b) 17 (c) 19 (d) 20

Show all work

Additional Space

Additional Space

Additional Space

