PICTON HIGH SCHOOL

Creating Opportunities Achieving Success

Year 11 Preliminary Mathematics Advanced 2024

Task 1 -Sighted Assessment Notification

Due Date: Wednesday 27th March (Period 5)	**Assessment Name:** Sighted Assessment
Marks: /30	**Weighting:** 30 %

SYLLABUS OUTCOMES TO BE ASSESSED:

MA11-1 uses algebraic and graphical techniques to **solve**, and where appropriate, **compare** alternative solutions to problems
MA11-9 provides reasoning to **support** conclusions which are appropriate to the context

DIRECTIVES TO BE ASSESSED:

Compare: show how things are similar or different **Solve:** find the value of the unknown pronumeral in an equation or inequality
Use: to manipulate something for a particular purpose to solve mathematical problems
Provides: to give a suitable solution or justification in context of the mathematical problem

TASK DESCRIPTION:

You have been given a number of questions from which a 50-minute examination will be created. The examination will include **14 short answers** each varying from 1 to 3 marks.

You will be required to prepare for this examination by completing the attached questions as a form of study/revision. The examination questions will be taken directly from the attached questions. Some of the following questions may be slightly modified.

The topics that will be assessed are:

- Chapter 1: Basic Arithmetic
- Chapter 2: Algebra and Surds

Check your assessment booklet for the PHS Assessment Policy

ASSESSMENT CRITERIA – STUDENT CHECKLIST:

- Have you completed the questions attached to this notification?
- Have you asked for additional help?
- Have you revised all content in the topics assessed?

Some of the following questions may be slightly modified. They may be used as multiple-choice questions or as find the error in the question.

1) Simplify $\frac{w^6 \times w^8}{w^4}$

2) Simplify $(2a^8b)^4$

3) If $x = \frac{1}{3}$ and $y = \frac{1}{9}$, find the value of x^4y^3.

4) Write $(\frac{1}{y})^{-11}$ without negative indices.

5) Prove that $(x^{\frac{1}{2}})$ is equal to $\sqrt{x}$.

6) Simplify $\frac{2(a^{-5})^2b^4}{4a^{-9}(b^2)^{-1}}$

7) What is the value of p so that $\frac{a^2a^{-3}}{\sqrt{a}} = a^p$?

8) Expand $2(3t + 1) - 3(t + 2) - 2$

9) Expand $(2y + 3)(3y - 1)$

10) Expand $(3x - 2)^2$

11) Factorise $y^2(x+4) + 2(x+4)$

12) Factorise $y^2 + 9y - 36$

13) Factorise $10b^2 + 3b - 1$

14) Factorise $y^2 - 1$

15) Factorise $16y^2 - 9$

16) Factorise $x^2 + 8x$ by completing the square

17) Simplify $\frac{x}{3} - \frac{x+1}{5}$

18) Simplify $\frac{x^2+3x+2}{x+2}$

19) Simplfy $\frac{x+1}{x} - \frac{2x+1}{3x}$

20) Simplify $\frac{3m-6m^2}{4} \times \frac{8m}{m^2-2m}$

21) Simplify $\frac{3p^2+7p-15}{6p-9}$

22) Simplify $\frac{3}{x-3} + \frac{2x+8}{x^2-9} \times \frac{x^2+5x+6}{2x-10}$

23) Find the value of E in the energy equation $E = mc^2$ if $m = 8.3$and $c = 1.7$.

24) Given that $v = u + at$ is the formula for the velocity of a particle at time t, find the value of

t when $u = 17.3, v = 100.6\ and\ a = 9.8$

25) Simplify $3\sqrt{2} + 5\sqrt{18}$

26) Find the value of p for $3\sqrt{75} - \sqrt{48} - \sqrt{243} = \sqrt{p}$

27) If $(2\sqrt{3} - \sqrt{5})^2 = a - \sqrt{b}$, evaluate $a\ and\ b$.

28) Express $\frac{2\sqrt{2}}{\sqrt{5}} + \frac{7}{\sqrt{2}}$ with a rational denominator.

29) Express with a rational denominator $\frac{1}{2\sqrt{5} - \sqrt{3}}$?

30) Simplify with positive integers $\frac{2^n \times 4^{n-1}}{8^{n-2}}$

31) A thin lens has focal length *p*, while another thin lens has a focal length *q*. The lenses are separated by a distance *d*. Find their combined focal length, which is given by the reciprocal of $(\frac{1}{p} + \frac{1}{q} - \frac{d}{pq})$.

32) Working alone, worker *A* can complete a task in *a* hours, and worker *B* can complete the same task in *b* hours. This means that *A* can complete $\frac{1}{a}$ of the task in one hour.

(a) Write an algebraic expression for the fraction of the task that could be completed in one hour if *A* and *B* work together.

(b) What does the reciprocal of this fraction represent?