SEKOLAH BUKIT SION – HIGH SCHOOL
AY 2020-2021

ADDITIONAL MATHEMATICS 0606
CHAPTER 3 TEST: INDICES

NAME: _____ **CLASS:** _____ **DATE:** _____

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INSTRUCTIONS:

1. **CHOOSE AND ANSWER ONLY 8 QUESTIONS.**
   (4 questions from Q1 – Q6, 4 questions from Q7 – Q12).

2. Use a file paper to answer the questions in an orderly and neat manner.
   Show necessary working. Marks may be deducted for incomplete working.

3. Use **black** or **blue** pen for working.
   Do not use highlighter or **correction tape**.

4. Once you are done, insert the **pdf printout** on the assigned page for this Chapter Test.
   Scan and upload your test (**in pdf)** by ***"Add work".***

   Filename format: ***NameClass_C3Test*** **Example:** ***Emman10.5_C3Test***

5. Submit on-time. You only are given an extra 5 minutes after the specified time duration to scan and attach your files.

   After the closing time, your work may NO LONGER be accepted.
   You may be given a zero score.

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QUESTION 01. **[6]**

Simplify:

(a) $(64x^6y^2)^{\frac{3}{2}}$

(b) Given that $\dfrac{\left(a^{\frac{1}{3}}b^{-\frac{1}{2}}\right)^3}{a^{-\frac{2}{3}}b^{\frac{1}{2}}} = a^p b^q$, find the value of each of the constants p and q.

QUESTION 02 **[6]**

(a) Simplify $\dfrac{72x^{\frac{2}{3}}}{(6x^{-3})^3}$.

(b) Simplify $\dfrac{27x^2y}{(3xyz)^3} \div \left(\dfrac{32x^2yz^3}{(2xy^3)^{-1/2}}\right)^0$, leaving your answer in positive index form.

QUESTION 03 **[6]**

(a) Solve $2^{x^2-5x} = \dfrac{1}{64}$.

(b) Solve the equation $16^{3x-1} = 8^{x+2}$.

QUESTION 04 **[5]**

Given that $2^{2x-1} \times 4^{x+y} = 128$ and $\frac{9^{2y-x}}{27^{y-4}} = 1$, find the value of each of the integers x and y.

QUESTION 05 **[5]**

(a) Solve $y^2 - 8y = -15$.

(b) Solve $x = 8\sqrt{x} - 15$

QUESTION 6 **[5]**

By appropriate substitution, solve $2(16^x) + 2 = 5(4^x)$.

QUESTION 07 **[6]**

(a) Rationalise and write as a single fraction $\frac{6+\sqrt{2}}{\sqrt{2}} + \frac{5-\sqrt{2}}{\sqrt{2}-3}$.

(b) Express $\frac{\left(2+\sqrt{5}\right)^2}{\sqrt{5}-1}$ in the form $\frac{a+b\sqrt{5}}{c}$.

QUESTION 08 **[6]**

(a) Simplify $7\sqrt{125} + \sqrt{20} - 3\sqrt{245} + x\sqrt{720}$

(b) Simplify $(2\sqrt{5} - 3\sqrt{2})(\sqrt{5} + 3\sqrt{2})$

QUESTION 09 **[5]**

(a) Show that $\left(2\sqrt{2} + 4\right)^2 - 8\left(2\sqrt{2} + 3\right) = 0.$

(b) Solve the equation $\left(2\sqrt{2} + 3\right)x^2 - \left(2\sqrt{2} + 4\right)x + 2 = 0$, giving your answer in the form $a + b\sqrt{2}$ where a and b are integers.

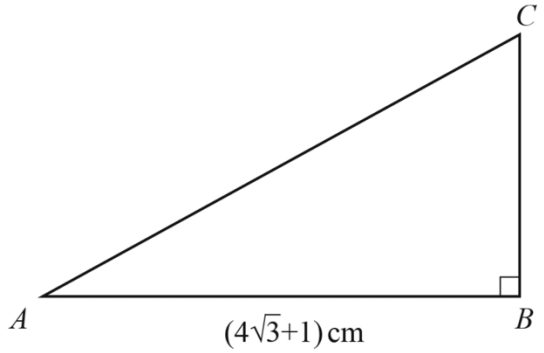
QUESTION 10 **[5]**

Solve $\sqrt{5x - 6} - \sqrt{2} = 2$, express you answer in the form $\frac{a+b\sqrt{2}}{c}$.

QUESTION 11 **[5]**

Solve for equation $2 + 3\sqrt{y} = 6\sqrt{3} + 5$, giving your answer in the form $a + b\sqrt{3}$ where a and b are integers.

QUESTION 12 **[5]**



The diagram shows triangle ABC with side $AB = \left(4\sqrt{3} + 1\right)$ cm. Angle B is a right angle. It is given that the area of this triangle is $\frac{47}{2}$ cm^2.

(a) Find the length of the side BC in the form $\left(a\sqrt{3} + b\right)$ cm, where a and b are integers.

(b) Hence find the length of the side AC in the form $p\sqrt{2}$ cm, where p is an integer.