FKS F3 Test 2 Laws of Integral Indices

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S3 Mathematics

Test 2: Laws of Integral Indices

Name : _____ Class : _____ ( )

Date : _____ Time : 30 minutes

Section A: Multiple Choice Questions (10 marks)

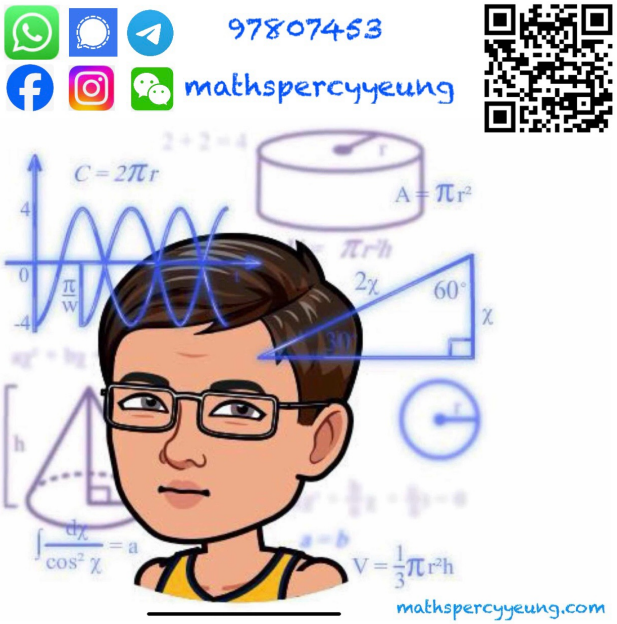
1. Which of the following numbers is the largest?

A. -3.21×10^{-16}

B. 3.21×10^{-16}

C. -3.21×10^{16}

D. 3.21×10^{16}



2. $-4.78 \times 10^{-5} =$

A. −0.000 047 8.

B. −0.000 478.

C. −478 000.

D. 478 000.

3. $3.5 \times 10^{-8} + 2 \times 10^{-7} =$

A. 2.35×10^{-7}.

B. 3.7×10^{-7}.

C. 3.52×10^{-8}.

D. 5.5×10^{-8}.

4. $1011011_2 =$

A. $5 \times 2^4 + 11$.

B. $5 \times 2^4 + 19$.

C. $5 \times 2^3 + 11$.

D. $5 \times 2^3 + 19$.

5. $110010100110_2 =$

A. $3 \times 2^{10} + 2^7 + 2^5 + 6 \times 2^0$.

B. $3 \times 2^{10} + 2^9 + 2^7 + 6 \times 2^1$.

C. $3 \times 2^{11} + 2^8 + 2^6 + 6 \times 2^0$.

D. $3 \times 2^{11} + 2^{10} + 2^8 + 6 \times 2^1$.

Write down the correct answers in the boxes.

1	2	3	4	5

Section B: Short Questions (33 marks)

6. Simplify each of the following and express the answer with positive indices.

(a) $\dfrac{b^{-3}}{(a^0 b)^2}$ **(b)** $\dfrac{a^{-2}b^6}{(a^3b^{-2})^2}$ (6 marks)

(c) $\dfrac{a^3(-b^{-2}c^5)^{-1}}{(a^{-3}b^4)^2 c^{-3}}$ **(d)** $\left(\dfrac{3a^{-1}b^4}{b^{-3}}\right)^3 \div \left(\dfrac{6a^2}{a^{-4}b^5}\right)^{-2}$ (6 marks)

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7. Simplify each of the following, where n is a positive integer.

(a) $8^{n-1} \cdot 4^{3n-2}$ **(b)** $\dfrac{2^{2n-1} \cdot 3^{2n-1}}{6^{2n+1}}$ (6 marks)

8. It is given that $3^x = 6$. Find the value of $27^{x-2} \cdot 9^{x+1}$. (3 marks)

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9. **(a)** Express 1100.011 in the expanded form.

(b) Convert 124 to a binary number.

(4 marks)

10. By using the fact that $415_{10} = 110011111_2$, convert the denary number 103.75_{10} into a binary number.

(3 marks)

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11. It is known that the price of a flat is \$17 500 per square feet and the area of the flat is 480 square feet.

(a) Express the price of the flat in scientific notation.

(b) The monthly salary of Ken is \$25 000 and he saved 40% of his salary every month. Assume the savings of Ken and the price of the flat remain unchanged. Find the number of years required for him to save enough money to buy the flat.

(5 marks)

Section C: *Bonus Questions (3 marks)

12. Convert 100011111_2 to a hexadecimal number.

(3 marks)

/5(+3)

END OF PAPER