High School
Mathematics Test 2013

Indices

Non Calculator Section

Skills and Knowledge Assessed:
- Investigate index notation and represent whole numbers as products of powers of prime numbers (ACMNA149)
- Use index notation with numbers to establish the index laws with positive integral indices and the zero index (ACMNA182)

Name_____

Answer all questions in the spaces provided on this test paper by:
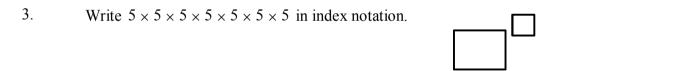*Writing the answer in the box provided.*
or
Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper.

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1. $2 \times 2 \times 2 \times 2 \times 2 = ?$

   ☐ 5×2 ☐ 2×5 ☐ 2^5 ☐ 5^2

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2. $3^6 = ?$

   ☐ $3 \times 3 \times 3 \times 3 \times 3 \times 3$ ☐ 3×6

   ☐ $6 \times 6 \times 6$ ☐ $3 + 3 + 3 + 3 + 3 + 3$

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3. Write $5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5$ in index notation.

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4. $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 = ?$

   ☐ $4 \times 2 \times 3 \times 3$ ☐ $2^4 \times 3^3$

   ☐ $4^2 \times 3^3$ ☐ $2^4 + 3^3$

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5. $2^3 \times 2^4 = ?$

   ☐ 2^5 ☐ 2^6 ☐ 2^7 ☐ 2^{12}

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6. Write the answer to $5^4 \times 5^5$ in index notation

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7. $a^{11} \times a^8 = ?$

   ☐ a^3 ☐ a^{18} ☐ a^{19} ☐ a^{88}

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8. $b^7 \times b^4 = ?$

9. $2^9 \div 2^6 = ?$

☐ $2^{1.5}$ ☐ 2^3 ☐ 2^{12} ☐ 2^{15}

10.   Write the answer to $7^{11} \div 7^7$ in index notation

11. $p^{16} \div p^8 = ?$

☐ p^2 ☐ p^4 ☐ p^8 ☐ p^{24}

12. $x^{12} \div x^{11} = ?$

13. $2^9 \div 2^9 = ?$

☐ 0 ☐ 1 ☐ 2^1 ☐ 2^2

14.   Write the answer to $9^6 \div 9^6$ in index notation and give its numerical value.

=

15. $3m^5 \times 2m^8 = ?$

☐ $5m^{13}$ ☐ $6m^{13}$ ☐ $5m^{40}$ ☐ $6m^{40}$

16. $5b^6 \times 3b^8 = ?$

17. $a \times a^9 \times a^2 = ?$

☐ a^{10} ☐ a^{11} ☐ a^{12} ☐ a^{18}

18. $\dfrac{x^5 \times x^{12}}{x^{11}} = ?$

19. $\left(a^8\right)^4 = ?$

   ☐ a^4 ☐ a^{12} ☐ a^{16} ☐ a^{32}

20. $\left(q^5\right)^3 = ?$

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Indices

Name_____

Answer all questions in the spaces provided on this test paper by:
   Writing the answer in the box provided.
      or
   Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper. Calculators are allowed.

1. $2^8 = ?$

   ⬭ 16   ⬭ 64   ⬭ 128   ⬭ 256

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2. Evaluate 5^6.

   [box]

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3. $a^{17} \times a^{19} = ?$

   ⬭ a^2 ⬭ a^{18} ⬭ a^{36} ⬭ a^{3349}

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4. $6.5b^9 \times 0.4b^{12} = ?$

   [box]

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5. $y^{39} \div y^{13} = ?$

   ⬭ y^3 ⬭ y^{26} ⬭ y^{30} ⬭ y^{507}

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6. Write the answer to $8^{36} \div 8^{32}$ in index notation and give its numerical value.

   [box]$^{[box]}$ = [box]

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7. $r^{95} \div r^{19} = ?$

   ⬭ r^5 ⬭ r^{38} ⬭ r^{76} ⬭ r^{114}

8. $4x^{12} \times 9x^{21} = ?$

9. $18m^{75} \div 6m^{15} = ?$

   ☐ $3m^5$ ☐ $3m^{60}$ ☐ $12m^5$ ☐ $12m^{60}$

10. Evaluate 135^0.

11. Simplify $18m^5 \div 2m^5 = ?$

   ☐ 9   ☐ $9m$ ☐ 16   ☐ $16m$

12. $15k^6 m^2 \times 3k^4 m^3 = ?$

13. $3z \times 2w^2z^4 \times 7w^2 = ?$

   ☐ $35z^4w^4$ ☐ $42z^5w^2$ ☐ $42z^4w^4$ ☐ $42z^5w^4$

14. $\dfrac{5s^7 \times 6s^{11}}{10s^9} = ?$

15. $\left(2p^5\right)^6 = ?$

   ☐ $12p^{11}$ ☐ $12p^{30}$ ☐ $64p^{11}$ ☐ $64p^{30}$

16. $\left(3y^9\right)^2 = ?$

17. $\dfrac{10p^3 \times 3p^9}{6p^2} = ?$

   ☐ $5p^6$ ☐ $5p^{10}$ ☐ $7p^6$ ☐ $7p^{10}$

18. Simplify $\dfrac{10p^3 \times 3p^9}{6p^2}$.

19. $\dfrac{12r^2w^3 \times 3rw^9}{6rw^2} = ?$

☐ $6r^2w^{10}$ ☐ $6r^3w^{10}$ ☐ $30r^2w^{10}$ ☐ $30r^3w^{10}$

20. Simplify $\dfrac{8s^3q^3 \times 10s^7q^9}{\left(4s^5q^2\right)^2}$.

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Indices

ANSWERS

Non Calculator Section

1.	2^5	11.	p^8
2.	$3 \times 3 \times 3 \times 3 \times 3 \times 3$	12.	$x^1 = x$
3.	5^7	13.	1
4.	$2^4 \times 3^3$	14.	$9^0 = 1$
5.	2^7	15.	$6m^{13}$
6.	5^9	16.	$15b^{14}$
7.	a^{19}	17.	a^{12}
8.	b^{11}	18.	x^6
9.	2^3	19.	a^{32}
10.	7^4	20.	q^{15}

Calculator Allowed Section

1.	256	12.	$45k^{10}m^5$
2.	15625	13.	$42z^5w^4$
3.	a^{36}	14.	$3s^9$
4.	$2.6b^{21}$	15.	$64p^{30}$
5.	y^{26}	16.	$9y^{18}$
6.	$8^4 = 4096$	17.	$5p^{10}$
7.	r^{76}	18.	$5p^{10}$
8.	$36x^{33}$	19.	$6r^2w^{10}$
9.	$3m^{60}$	20.	$5q^8$
10.	1		
11.	9		