Names: _____ Date: _____ Block: _____

Mrs. van der Vossen Math 9

Exponents Practice

Multiple Choice -- *Write your answer on the line beside the question (1 mark each)*

____ 1. If a colony of 1000 bacteria doubles in size every 2 h, what is the size of the colony after 6 h?
a. 2000 b. 6000 c. 8000 d. 64 000

____ 2. In the expression 7^4, what does the number 4 represent?
a. base b. exponent c. multiple d. power

____ 3. In the expression 5^9, what does the number 5 represent?
a. base b. exponent c. multiple d. power

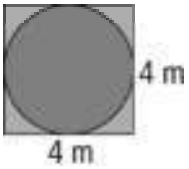
____ 4. Evaluate the power $(-3)^5$.
a. 243 b. 15 c. –15 d. –243

____ 5. What is the value of -4^6?
a. -4096 b. –24 c. 24 d. 4096

____ 6. Determine the value of $(–3)^0$.
a. –3 b. –1 c. 0 d. 1

____ 7. The kinetic energy, in joules (J), of a moving object can be calculated using the formula $E = \frac{1}{2}mv^2$, where m is the mass (in kg) of the object and v is the velocity (in m/s) of the object.
How much kinetic energy does a 1500-kg car travelling at a speed of 28 m/s have?
a. 1 176 000 J b. 588 000 J c. 42 000 J d. 21 000 J

____ 8. A square flooring tile has a circular design printed on it. If the tile is 4 m long on each side, what is the area of the tile not covered by the design?



a. 0.86 m^2 b. 3.43 m^2 c. 13.73 m^2 d. 205.74 m^2

Completion *Complete each statement. (1 mark each)*

9. When multiplying powers with the same base, keep the base the same and _____ the exponents.
10. Any base raised to the exponent of zero equals _____.
11. The power $\left(5^2\right)^4$, when written as a single exponent, is equal to _____.
12. The volume of a cube with side lengths of 12 cm is _____.
13. 9 x 9 x 9 x 9 x 9 x 9 x 9 x 9 expressed as a power is _____.
14. 243 expressed as a power with base 3 is _____.

Short Answer *Complete the following questions. Remember units and proper rounding count for marks. Circle your answers and show your work. Marks as listed.*

15. Write each power as repeated multiplication, and evaluate. (2 marks each)
a) 7^4 **b)** $(-2)^3$

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16. Write each expression as a power AS SHOWN. Then evaluate. (2 marks each)
a) -9 x -9 x -9 x -9 **b)** –1 x 8 x 8

c) 3(4 x 4)(4 x 4)(4 x 4) **d)** $\frac{5\times5\times5\times5\times5\times5\times5}{5\times5\times5\times5}$

e) $\frac{7\times7\times7\times7\times7\times7}{7\times7\times7\times7\times7\times7\times7\times7\times7}$ **f)** $\frac{2}{3}\times\frac{2}{3}\times\frac{2}{3}\times\frac{2}{3}$

17. Evaluate. (a-d 1 mark each and e-h 2 marks each)

a) $10 \times 4 + 6^2$

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c) $5(2)^5 - 6^2 \times 2$

d) $4 \times (9^2 + 3^2 \times 2)$

e) $(6^3 - 4^3) + 4 - 5\,(7^2 + 30)$

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g) $\dfrac{6^3 - 4^3}{2\left(2^2 \times 19\right)}$

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Word Problems *Show all steps leading to a solution. 2 marks each..*

18. **a)** The number of insects in a colony doubles every month. There are currently 1000 insects in the colony. How many insects will there be after one year?

    b) A population of 10 000 bees doubles every month. Determine the population of bees 8 months ago.

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19. On a test, Laura completes the expression as shown. $4^3 \times 3^5 = 12^8$
    a) Did Laura make a mistake? Justify your thinking.

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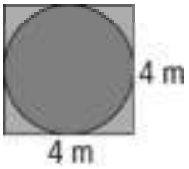

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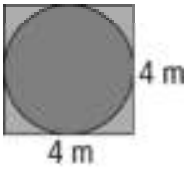

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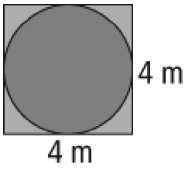

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