EXPONENTS & POWERS PRACTICE TEST /63

**PART A: MULTIPLE CHOICE** *(13 marks)*

1. Determine the volume of a cube that has a side length of 13 cm.

**a.**39 cm2  **b.**169 cm2 **c.**78 cm3 **d.**2197 cm3

2. Express 4096 as a power of 8

**a.** 38 **b.** 83 **c.** 48 **d.** 84

3**.** Which power has the greatest value? -322, 46, (-5)4, 210

**a.** 210 **b.** (-5)4 **c.**46 **d .**-322

1. What is the value of -46 ?

**a.** -4096 **b.** 24 **c.** –24 **d.** 4096

5**.** Evaluate 

**a.**  **b.**  **c.** **d.** 

6.When evaluating the expression 43  ÷ (8 – 9 x 2), what is the last operation to be completed?

**a.** addition **b.** division **c.** brackets **d.** exponent

7.What is (8 + 4)2 – (43 – 25) – 4 ?

**a.** 12 **b.** 72 **c.** 28 **d.** 108

8.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.** 8000 **c.** 6000 **d.** 64 000

9.In the expression 74 what does the number 4 represent?

**a.**base **b.** multiple **c.** exponent **d.** power

10.What is the value of  ?

**a.** –5 **b.** –125 **c.** –25 **d.** –625

11.Express (–4)3 x (–4)9 as a single power.

**a.** (–4)3 **b.** (–4)12 **c.** (–4)6 **d.** (–4)18

12.What is (82 –24) x 23 – 4 ?

**a.** 0, **b.** 12 **c.** 2 **d.** 380

13.What is (8 + 4)2 – (43 – 25) x 4 ?

**a.** 16 **b.** 72 **c.** 28 **d.** 24

**PART B: WRITTEN SECTION** *(50 marks)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| POWER | BASE | EXPONENT | REPEATED MULTIPLICATION | STANDARD FORM  (SOLVE) |
| 35 |  |  |  |  |
| (–2)4 |  |  |  |  |
|  | 10 | 3 |  |  |
|  |  |  | – (2 × 2 × 2 × 2 × 2 × 2) |  |

1. Fill in the table. *(7 marks)*

**2.** Write as a power of 10. *(2 marks)*

**a)** ten \_\_\_\_\_\_\_ **b)** 10 × 10 × 10 × 10 \_\_\_\_\_\_\_

**c)** –10 \_\_\_\_\_\_\_\_ **d)** 10 000 000 \_\_\_\_\_\_\_\_\_\_\_\_\_

**3.** Write each expression as a product (answer when you multiply) or quotient (answer when you divide) of powers. *(1.5 marks)*

**a)** (2 × 3)5 \_\_\_\_\_ **b)**  \_\_\_\_\_\_\_ **c)** (12 ÷ 4)3 \_\_\_\_\_\_\_\_

**4.** Write each power of a power as a single power, then evaluate it. *(1.5 marks)*

**a)** (98)0 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **b)** [(–2)4]2 \_\_\_\_\_\_\_\_\_\_\_\_ **c)** –(32)3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5.** Write each expression as a power, then evaluate it. *(5 marks)*

**a)** 33 × 32 **b)** (–2)4 × (–2)0

**c)** 511 ÷ 510 **d)** 108 × 102 ÷ 106

**e)**

**6.** Evaluate each expression. Show your work. *(8 marks)*

**a)** (–14 – 6)2 + 11 **b)** 8 ÷ (–2) + (4 × 2)2

**c)** [7 – (–3)]4 – (30 ÷ 6)3 **d)** [(4 – 10)3 × (3 + 3)5]0

**7.** For each pair of powers, which power is greater? *(3 marks)*

**i)** 83 or 38  **ii)** 210 or 102 \_\_\_\_\_\_\_\_\_\_\_\_  **iii)** 51 or 15\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**8. a)** Evaluate each power. *(5 marks)*

**i)** –24 \_\_\_\_\_\_\_\_\_\_\_\_  **ii)** (–24) \_\_\_\_\_\_\_  **iii)** (–2)4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**b)** Explain why all the powers in part a do not have the same value.

**9.** Evaluate each expression. Show your work. *(10 marks)*

**a)**(6 – 8)5 ÷ (–4) **b)** –40 – (8 – 3)3

**c)** 24 × 21 – 23 × 22 **d)** 42 × 4 + 33 × 32

**e)** (–4)3 ÷ (–4)2 × (–4)0 + (–4)2 ÷ (–4)

**10.** Simplify using exponent laws when possible, then evaluate each expression. Show your work.

*(4 marks)*

**a)** [(–3)3]3 × [(–4)0]3 – [(–3)5]0 **b)** [(–4) × (–5)]4 + [(–4)2]2 – [(–2)8 ÷ (–2)7]3

**11.** On a test, Randy used his calculator to evaluate this expression:  *(3 marks)*The answer that was displayed was 162.

**a)** Is this answer correct?

**b)** If your answer is no, what error did Randy make?

**c)** Show the solution to the problem to verify your answer in part a