

**Hillel Academy**  
**Mathematics**  
**Grade 8**  
**POWERS & ROOTS WORKSHEET**

**Section 1**

Fill in the blanks below with the most suitable word or phrase:

1. Zero divided by any real number is zero, any real number divided by zero is undefined.

(2)

2. The square root of any positive number is positive & negative / has two roots, the square root of any negative number not a real number / does not exist.

(2)

3. The cube root of any positive number always positive, the cube root of any negative number always negative.

(2)

4. Another notation that can be used to represent a square root ( $\sqrt{\quad}$ ) is power of  $\frac{1}{2}$ ; another notation that can be used to represent a cube root ( $\sqrt[3]{\quad}$ ) is power of  $\frac{1}{3}$ .

(2)

**Section 2**

Without the use of a calculator evaluate the following:

1.  $(-400)^2 = \frac{160,000}{(-4)^2 \times 100^2}$   
 $16 \times 10000$   
 $160,000$

(2)

2.  $(50)^3 = \frac{125,000}{5^3 \times 10^3}$   
 $125 \times 1000$   
 $125,000$

(2)

3.  $(0.00011)^2 = \frac{0.000000121}{11^2 \div 10000^2}$   
 $121 \div 10000000000$   
 $0.00000000121$

(2)

4.  $\left(\frac{5ab^2}{3c^3}\right)^3 = \frac{125a^3b^6}{27c^9}$   
 $\frac{5^3 \times a^{1 \times 3} \times b^{2 \times 3}}{3^3 \times c^{3 \times 3}}$   
 $\frac{125a^3b^6}{27c^9}$

(2)

**Section 3**

Without the use of a calculator evaluate the following:

1.  $\sqrt{144,000,000} = \underline{12,000}$

$$\begin{array}{l} \sqrt{144} \times \sqrt{1000000} \\ 12 \times 1000 \\ 12000 \end{array}$$

(2)

2.  $\sqrt[3]{-27000} = \underline{-30}$

$$\begin{array}{l} \sqrt[3]{-27} \times \sqrt[3]{1000} \\ -3 \times 10 \\ -30 \end{array}$$

(2)

OR  $(\sqrt{144000000})^2 = 144,000,000$

3.  $(0.000625)^{\frac{1}{2}} = \underline{0.025}$

$$625^{\frac{1}{2}} \div 1000000^{\frac{1}{2}}$$

$$25 \div 1000$$

$$\underline{0.025}$$

(5)

4.  $(-13,824)^{\frac{1}{3}} = \underline{-24}$

$$(-2^3 \times 3^3)^{\frac{1}{3}}$$

$$-2^3 \times 3^1$$

$$-8 \times 3$$

$$\underline{-24}$$

(2)

2	13824
2	6912
2	3456
2	1728
2	864
2	432
2	216
2	108
2	54
3	27
3	9
3	3
3	1

**Section 4**

Without the use of a calculator evaluate the following (remember to use BEMDAS):

1.  $(5+2)^2 - 9 \times 3 - 2^3 = \underline{21}$

$$7^2 - 27 - 8$$

$$49 - 27 - 8$$

$$22 - 8$$

$$\underline{14}$$

(4)

2.  $(\sqrt{81} - 8)^3 + 3 \times 2^4 + 0 \times 5^2 = \underline{49}$

$$(9-8)^3 + 3 \times 16 + 0$$

$$1^3 + 48 + 0$$

$$\underline{49}$$

(4)

3.  $9 + 6(7-2) \div 3 - [8 - (3^2 - \sqrt{16})] = \underline{16}$

$$9 + 6(5) \div 3 - [8 - (9-4)]$$

$$9 + 10 - [8-5]$$

$$19 - 3$$

$$\underline{16}$$

(4)

4.  $\frac{2^4 + (16 - 3 \times 4)}{(6 + 3^2) \div \sqrt{1 + 2 \times 4}} = \underline{4}$

$$\frac{16 + (16 - 12)}{(6 + 9) \div \sqrt{9}}$$

$$\frac{16 + 4}{15 \div 3}$$

$$\frac{20}{5}$$

$$\underline{4}$$

(4)