

MATHEMATICS
GRADE 9
STANDARD FORM WORKSHEET

Student Assessment I

1. Write the following numbers in standard form:

- | | |
|-------------------|-----------------|
| a) 8 million | b) 0.000 72 |
| c) 75 000 000 000 | d) 0.0004 |
| e) 4.75 billion | f) 0.000 000 64 |

2. Write the following numbers in order of magnitude, starting with the smallest:

$$6.2 \times 10^7 \quad 5.5 \times 10^{-3} \quad 4.21 \times 10^7 \quad 4.9 \times 10^8 \quad 3.6 \times 10^{-5} \\ 7.41 \times 10^{-9}$$

3. Write the following numbers:

- a) in standard form,
b) in order of magnitude, starting with the largest.

$$6 \text{ million} \quad 820\,000 \quad 0.0044 \quad 0.8 \quad 52\,000$$

4. Deduce the value of n in each of the following:

- | | |
|-----------------------------------|---------------------------------------|
| a) $620 = 6.2 \times 10^n$ | b) $555\,000\,000 = 5.55 \times 10^n$ |
| c) $0.000\,45 = 4.5 \times 10^n$ | d) $500^2 = 2.5 \times 10^n$ |
| e) $0.0035^2 = 1.225 \times 10^n$ | f) $0.04^3 = 6.4 \times 10^n$ |

5. Write the answers to the following calculations in standard form:

- | | |
|---|---|
| a) $4000 \times 30\,000$ | b) $(2.8 \times 10^5) \times (2.0 \times 10^3)$ |
| c) $(3.2 \times 10^9) \div (1.6 \times 10^4)$ | d) $(2.4 \times 10^8) \div (9.6 \times 10^2)$ |

6. The speed of light is 3×10^8 m/s. Venus is 108 million km from the Sun. Calculate the number of minutes it takes for sunlight to reach Venus.
7. A star system is 500 light years away from Earth. If the speed of light is 3×10^5 km/s, calculate the distance the star system is from Earth. Give your answer in kilometres and written in standard form.

Student Assessment 2

1. Write the following numbers in standard form:

- | | |
|------------------|------------------|
| a) 6 million | b) 0.0045 |
| c) 3 800 000 000 | d) 0.000 000 361 |
| e) 460 million | f) 3 |

2. Write the following numbers in order of magnitude, starting with the largest:

$$3.6 \times 10^2 \quad 2.1 \times 10^{-3} \quad 9 \times 10^1 \quad 4.05 \times 10^8 \quad 1.5 \times 10^{-2} \\ 7.2 \times 10^{-3}$$

3. Write the following numbers:

- a) in standard form,
b) in order of magnitude, starting with the smallest.

$$15 \text{ million} \quad 430\,000 \quad 0.000\,435 \quad 4.8 \quad 0.0085$$

4. Deduce the value of n in each of the following:

- | | |
|-------------------------------|--|
| a) $4750 = 4.75 \times 10^n$ | b) $6\,440\,000\,000 = 6.44 \times 10^n$ |
| c) $0.0040 = 4.0 \times 10^n$ | d) $1000^2 = 1 \times 10^n$ |
| e) $0.9^3 = 7.29 \times 10^n$ | f) $800^3 = 5.12 \times 10^n$ |

5. Write the answers to the following calculations in standard form:

- | | |
|--|---|
| a) $50\,000 \times 2400$ | b) $(3.7 \times 10^6) \times (4.0 \times 10^4)$ |
| c) $(5.8 \times 10^7) + (9.3 \times 10^6)$ | d) $(4.7 \times 10^6) - (8.2 \times 10^5)$ |

6. The speed of light is 3×10^8 m/s. Jupiter is 778 million km from the Sun. Calculate the number of minutes it takes for sunlight to reach Jupiter.
7. A star is 300 light years away from Earth. If the speed of light is 3×10^5 km/s, calculate the distance from the star to Earth. Give your answer in kilometres and written in standard form.

ANSWERS

Student Assessment 1

1. a) 8×10^6 b) 7.2×10^{-4} c) 7.5×10^{10}
d) 4×10^{-4} e) 4.75×10^9 f) 6.4×10^{-7}
2. 7.41×10^{-9} 3.6×10^{-5} 5.5×10^{-3}
 4.21×10^7 6.2×10^7 4.9×10^8
3. a) 6×10^6 8.2×10^5 4.4×10^{-3} 8×10^{-1}
 5.2×10^4
b) 6×10^6 8.2×10^5 5.2×10^4 8×10^{-1}
 4.4×10^{-3}
4. a) 2 b) 8 c) -4 d) 5 e) -5
f) -5
5. a) 1.2×10^8 b) 5.6×10^8 c) 2×10^5
d) 2.5×10^5
6. 6 minutes
7. 4.73×10^{15} km correct to three significant figures (3 s.f.)

Student Assessment 2

1. a) 6×10^6 b) 4.5×10^{-3} c) 3.8×10^9
d) 3.61×10^{-7} e) 4.6×10^8 f) 3×10^0
2. 4.05×10^8 3.6×10^2 9×10^1 1.5×10^{-2}
 7.2×10^{-3} 2.1×10^{-3}
3. a) 1.5×10^7 4.3×10^5 4.35×10^{-4}
 4.8×10^0 8.5×10^{-3}
b) 4.35×10^{-4} 8.5×10^{-3} 4.8×10^0
 4.3×10^5 1.5×10^7
4. a) 3 b) 9 c) -3 d) 6 e) -1
f) 8
5. a) 1.2×10^8 b) 1.48×10^{11} c) 6.73×10^7
d) 3.88×10^6
6. 43 minutes (2 s.f.)
7. 2.84×10^{15} km (3 s.f.)