

Work with numbers greater than 1 in standard form

1 Complete the statements.

- a) $30,000 = 3 \times 10,000 = 3 \times 10^4$
- b) $600,000 = 6 \times 100,000 = 6 \times 10^5$
- c) $700 = 7 \times 100 = 7 \times 10^2$
- d) $8,000,000 = 8 \times 1,000,000 = 8 \times 10^6$
- e) three hundred thousand = $3 \times 100,000 = 3 \times 10^5$
- f) four billion = $4 \times 1,000,000,000 = 4 \times 10^9$
- g) twenty million = $2 \times 10,000,000 = 2 \times 10^7$

2 Tick the numbers that are **not** in standard index form.

| | | | |
|-----------------------------|-------------------------------|-----------------------|-----------------|
| 50×10^7 ✓ | $5 \times 10^{\frac{3}{4}}$ ✓ | 0.5×10^3 ✓ | 5×10^6 |
| $\frac{3}{4} \times 10^5$ ✓ | 6×10^{72} | $9 \times 10^{1.5}$ ✓ | 1×10^1 |

3 Write $>$, $<$ or $=$ to complete the statements.

- a) $10,000 < 10^5$
- b) $400,000 > 8 \times 10^4$
- c) $6 \times 10^2 = 600$
- d) $20,000 = 2 \times 10^4$
- e) $3 \times 10^7 > 3,700,000$

4 Write the standard form numbers as ordinary numbers.

- a) $9 \times 10^5 = 900,000$
- b) $8 \times 10^7 = 80,000,000$
- c) $4 \times 10^8 = 400,000,000$
- d) $6 \times 10^3 = 6,000$
- e) $7 \times 10^2 = 700$
- f) $10^6 = 1,000,000$

5 Fill in the missing information.

- a) $60,000 = 6 \times 10,000 = 6 \times 10^4$
- b) $70,000 = 7 \times 10,000 = 7 \times 10^4$
- c) $65,000 = 6.5 \times 10,000 = 6.5 \times 10^4$
- d) $63,000 = 6.3 \times 10,000 = 6.3 \times 10^4$
- e) $780,000 = 7.8 \times 100,000 = 7.8 \times 10^5$
- f) $9900 = 9.9 \times 1,000 = 9.9 \times 10^3$
- g) $680,000 = 6.8 \times 100,000 = 6.8 \times 10^5$
- h) $834,000,000 = 8.34 \times 100,000,000 = 8.34 \times 10^8$

6 Write the numbers in standard index form.

- a) $50,000 = 5 \times 10^4$
- b) $53,000 = 5.3 \times 10^4$
- c) $53,200 = 5.32 \times 10^4$
- d) $500,000 = 5 \times 10^5$
- e) $520,000 = 5.2 \times 10^5$
- f) $502,000 = 5.02 \times 10^5$

7 Write the standard form numbers as ordinary numbers.

a) $4 \times 10^5 =$ 400,000

e) $6.1 \times 10^3 =$ 6,100

b) $4.1 \times 10^5 =$ 410,000

f) $6.1 \times 10^4 =$ 61,000

c) $4.01 \times 10^5 =$ 401,000

g) $6.1 \times 10^5 =$ 610,000

d) $4.001 \times 10^5 =$ 400,100

h) $1.6 \times 10^5 =$ 160,000

8 a) The planet Mercury is on average 58 million km from the Sun.
Write this distance in standard form.

5.8×10^7 km

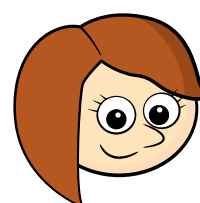
b) The planet Neptune is on average 4.5×10^9 km from the Sun.
Write this distance as an ordinary number.

4,500,000,000 km

c) The number of bacteria in the average human body is estimated to be 39,000,000,000,000.
Write this number in standard form.

3.9×10^{13}

9 a)



9 is greater than 2, so 9×10^5 is greater than 2×10^6

Do you agree with Rosie? No

Explain why.

b) Write the numbers in ascending order.

| | | | | |
|-----------|-----------------|-------------|-------------------|-------------|
| 4 billion | 4×10^7 | 410,000,000 | 4.2×10^5 | 401 million |
|-----------|-----------------|-------------|-------------------|-------------|

4.2×10^5 , 4×10^7 , 401 million, 410,000,000, 4 billion

| | | | | |
|--------------------|-----------|-------------|-------------------|-----------------|
| 8×10^{10} | 8 billion | 800 million | 8.8×10^7 | 800,000,000,000 |
|--------------------|-----------|-------------|-------------------|-----------------|

8.8×10^7 , 800 million, 8 billion, 8×10^{10} , 800,000,000,000

10



50×10^5 is not in standard form.
 $50 \times 10^5 = 5 \times 10^1 \times 10^5 = 5 \times 10^6$
Now the number is in standard form.

Use Whitney's reasoning to write the numbers in standard form.

a) $30 \times 10^4 =$ 3×10^5 d) $10 \times 7 \times 10^4 =$ 7×10^5

b) $200 \times 10^5 =$ 2×10^7 e) $8,000 \times 10^1 =$ 8×10^4

c) $230 \times 10^5 =$ 2.3×10^7 f) $91.7 \times 10^4 =$ 9.17×10^5