

Examples

Workout



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Question 1: Write each of the following numbers in standard form.

- | | | | |
|---------------|-----------------|----------------|----------------|
| (a) 40000 | (b) 2000000 | (c) 8000000 | (d) 7000 |
| (e) 100000000 | (f) 900 | (g) 250000 | (h) 1900 |
| (i) 54000000 | (j) 11000000 | (k) 89000 | (l) 3600000000 |
| (m) 43500 | (n) 91900000 | (o) 1230000000 | (p) 71120 |
| (q) 9804000 | (r) 471500 | (s) 55403 | (t) 2936000 |
| (u) 93508000 | (v) 333810000 | (w) 9800200000 | (x) 49300 |
| (y) 804000 | (z) 69702000000 | | |

Question 2: Write each of the following as ordinary numbers

- | | | | |
|--------------------------|----------------------------|--------------------------|-------------------------|
| (a) 3×10^4 | (b) 9×10^3 | (c) 6×10^6 | (d) 2×10^{10} |
| (e) 5×10^7 | (f) 1.2×10^2 | (g) 2.9×10^5 | (h) 8.4×10^8 |
| (i) 7.7×10^4 | (j) 3.51×10^5 | (k) 9.89×10^7 | (l) 1.27×10^9 |
| (m) 4.05×10^6 | (n) 1.616×10^5 | (o) 2.0651×10^3 | (p) 8.829×10^7 |
| (q) 1.0051×10^6 | (r) 2.143578×10^4 | | |

Question 3: Write each of the following numbers in standard form.

- | | | | |
|-----------------|-----------------------|------------------|----------------|
| (a) 0.002 | (b) 0.0005 | (c) 0.9 | (d) 0.00000004 |
| (e) 0.00065 | (f) 0.0022 | (g) 0.0361 | (h) 0.000558 |
| (i) 0.00000423 | (j) 0.0000000981 | (k) 0.00407 | (l) 0.02052 |
| (m) 0.0000515 | (n) 0.006015 | (o) 0.0000000082 | (p) 0.00007005 |
| (q) 0.000000024 | (r) 0.000000000000005 | | |

Question 4: Write each of the following as ordinary numbers

- (a) 2×10^{-3} (b) 7×10^{-2} (c) 3×10^{-6} (d) 9×10^{-8}
- (e) 4.8×10^{-4} (f) 6.7×10^{-3} (g) 9.2×10^{-6} (h) 4.1×10^{-2}
- (i) 3.16×10^{-5} (j) 8.62×10^{-4} (k) 7.09×10^{-6} (l) 5.71×10^{-3}
- (m) 2.05×10^{-8} (n) 4.112×10^{-2} (o) 1.651×10^{-3} (p) 2.0019×10^{-7}

Question 5: Write these numbers in standard form

- (a) one million (b) nine thousand (c) forty thousand (d) nine billion
- (e) 500^2 (f) 200^3 (g) $30,000^2$ (h) two thousandths

Question 6: Write each of these numbers in standard form

- (a) 72×10^3 (b) 84×10^6 (c) 500×10^2 (d) 210×10^4
- (e) 0.8×10^7 (f) 0.46×10^5 (g) 0.06×10^8 (h) 0.007×10^{12}
- (i) 3000×10^{14} (j) 24×10^{-5} (k) 0.8×10^{-10} (l) 0.0055×10^{-2}
- (m) 0.0372×10^{-9} (n) 65213×10^{-7} (n) 2933×10^{21} (o) 759300×10^{-1}

Question 7: Work out the answers to the following multiplications.
You may not use a calculator.

- (a) $2 \times 10^3 \times 3 \times 10^4$ (b) $(4 \times 10^8) \times (2 \times 10^5)$ (c) $1.2 \times 10^4 \times 6 \times 10^4$
- (d) $(3 \times 10^{-9}) \times (3 \times 10^3)$ (e) $4 \times 10^{-7} \times 3 \times 10^{-2}$ (f) $6 \times 10^{10} \times 4 \times 10^8$
- (g) $7 \times 10^{12} \times 8 \times 10^{-9}$ (h) $3.7 \times 10^5 \times 5 \times 10^6$ (i) $(8 \times 10^3) \times (5 \times 10^5)$
- (j) $5 \times 10^{-14} \times 4 \times 10^{-7}$ (k) $1.8 \times 10^2 \times 2 \times 10^{-8}$ (l) $5.8 \times 10^6 \times 4 \times 10^7$
- (m) $4.5 \times 10^{20} \times 9 \times 10^{-14}$ (n) $(1.1 \times 10^{-5}) \times (1.2 \times 10^{-2})$ (o) $6.2 \times 10^4 \times 7 \times 10^9$
- (p) $2.8 \times 10^8 \times 1.3 \times 10^7$ (q) $1.25 \times 10^{-16} \times 3.2 \times 10^{10}$ (r) $8.7 \times 10^2 \times 9.2 \times 10^6$
- (s) $2 \times 10^2 \times 3 \times 10^7 \times 6 \times 10^4$ (t) $3 \times 10^6 \times 2.1 \times 10^{-8} \times 5 \times 10^{12}$

Question 8: Work out the answers to the following divisions.
You may not use a calculator.

- (a) $(8 \times 10^5) \div (2 \times 10^3)$ (b) $(9 \times 10^9) \div (3 \times 10^4)$ (c) $(5 \times 10^6) \div (2 \times 10^2)$
(d) $(9 \times 10^9) \div (4 \times 10^9)$ (e) $(1.2 \times 10^4) \div (3 \times 10^8)$ (f) $(3.5 \times 10^2) \div (5 \times 10^9)$
(g) $(4.8 \times 10^{15}) \div (3 \times 10^4)$ (h) $(6.4 \times 10^3) \div (8 \times 10^{16})$ (i) $(2.7 \times 10^{-3}) \div (9 \times 10^7)$
(j) $(1.44 \times 10^8) \div (12 \times 10^{-5})$ (k) $(2 \times 10^{10}) \div (5 \times 10^{-2})$ (l) $(1 \times 10^{-5}) \div (4 \times 10^{-2})$
(m) $(5 \times 10^{-6}) \div (8 \times 10^{-14})$ (n) $(8.1 \times 10^{-9}) \div (2.7 \times 10^3)$ (o) $(1.6 \times 10^7) \div (8 \times 10^2)$
(p) $(3 \times 10^{22}) \div (8 \times 10^9)$ (q) $(3.92 \times 10^8) \div (1.4 \times 10^{-6})$ (r) $(3 \times 10^{-4}) \div (1.2 \times 10^7)$

Question 9: Work out the answers to the following.
You may not use a calculator.

- (a) $(3 \times 10^3)^2$ (b) $(2 \times 10^6)^2$ (c) $(5 \times 10^4)^2$ (d) $(8 \times 10^5)^2$
(e) $(9 \times 10^{10})^2$ (f) $(6 \times 10^{-3})^2$ (g) $(2.5 \times 10^{-6})^2$ (h) $(1.2 \times 10^8)^2$
(i) $(2 \times 10^5)^3$ (j) $(4 \times 10^9)^3$ (k) $(3 \times 10^{15})^3$ (l) $(5 \times 10^{-7})^3$
(m) $(2 \times 10^6)^4$ (n) $(1 \times 10^{-4})^6$ (o) $(8.3 \times 10^{-2})^2$ (p) $(9.7 \times 10^3)^2$

Question 10: Work out each of the following

- (a) $5 \times 10^4 + 3 \times 10^4$ (b) $4 \times 10^3 - 2 \times 10^3$ (c) $2.5 \times 10^5 + 3.3 \times 10^5$
(d) $7 \times 10^{-2} + 2 \times 10^{-2}$ (e) $6 \times 10^3 + 8 \times 10^2$ (f) $2 \times 10^6 - 8 \times 10^5$
(g) $2.6 \times 10^8 + 4.5 \times 10^9$ (h) $5.12 \times 10^5 - 1.89 \times 10^4$ (i) $(8 \times 10^7) + (3 \times 10^5)$
(j) $5.07 \times 10^{10} + 2.77 \times 10^9$ (k) $6.12 \times 10^{-3} - 1.07 \times 10^{-2}$ (l) $4 \times 10^{-7} + 9 \times 10^{-5}$
(m) $3.44 \times 10^8 + 7.03 \times 10^6 + 9.89 \times 10^7$

Standard Form

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Question 11: Using a calculator, work out the following

- (a) $3.57 \times 10^3 \times 6.7 \times 10^7$ (b) $9.5 \times 10^4 + 3.8 \times 10^5$ (c) $1.8 \times 10^9 \times 5.2 \times 10^9$
(d) $7 \times 10^{-8} \times 2 \times 10^{-6}$ (e) $(7.71 \times 10^{15}) \div (6 \times 10^4)$ (f) $(8 \times 10^9)^3$
(g) $(5 \times 10^{-7})^{-3}$ (h) $2.55 \times 10^7 \times 8.02 \times 10^4 \times 1.1 \times 10^5$

Apply

Question 1: The distance between London and New York is 5,567,000 metres.
Write this number in standard form.

Question 2: The distance from the Sun to Pluto is 3.67 billion miles.
Write this number in standard form.



Question 3: The length of a cell is 0.016 mm
Write this number in standard form.

Question 4: The population of a country is 6.51×10^5
Write the population of the country as an ordinary number.

Question 5: 32,010 people attend a football match between West Ham and Southampton.
Write this number in standard form.



Question 6: There are approximately 5×10^4 grains of rice in a one kilogram bag of rice.
Approximately how many grains of rice will be in 20 one kilogram bags of rice?

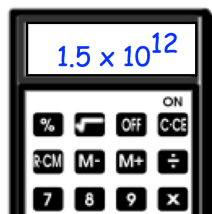
Question 7: A penny weighs 0.0036kg.
Find the total mass of £400 worth of pennies.

Question 8: $A = 6 \times 10^5$ $B = 30000$ $C = 5 \times 10^{-2}$
(a) Work out AB
(b) Work out C^2

Standard Form

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- Question 9: The population of the United Kingdom in 1950 was 5.06×10^7
The population of the United Kingdom in 2015 was 6.47×10^7
Work out how many more people live in the United Kingdom in 2015 than 1950.
Give your answer as an ordinary number.
- Question 10: Peter has multiplied two numbers using his calculator.
The calculator shows the answer.
He can remember that one number was 5000.
What was the other number used in the multiplication?



- Question 11: An asteroid travels at 25 kilometres per second.
How far does it travel in one hour?
Give your answer in standard form.

- Question 12: Without using a calculator, work out.

$$\sqrt{4.9 \times 10^{11}}$$

- Question 13: The mass of Earth is 5.97×10^{24}
The mass of Jupiter is 1.898×10^{27}
Using a calculator, work out how many times heavier Jupiter is than Earth.
Give your answer to one decimal place.

- Question 14: The density of Nitrogen is $1.25 \times 10^{-6} \text{ kg/cm}^3$
Calculate the mass of one cubic metre of Nitrogen.

Answers



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