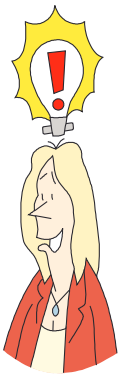
# Number Work with Factors.



A. 4 x 25 = 100. We can use this fact when multiplying by 25.
Dividing by 4 will tell us how many hundreds we have.

E.g. 1. 24 x 25 = 6 hundreds = 600.
E.g. 2. 17 x 25 = $4^1/_4$ hundreds = 425.

Use this method to calculate the following:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1). | 12 x 25 | 2). | 28 x 25 | 3). | 16 x 25 | 4). | 44 x 25 | 5). | 36 x 25 |
| 6). | 52 x 25 | 7). | 64 x 25 | 8). | 84 x 25 | 9). | 56 x 25 | 10). | 76 x 25 |
| 11). | 92 x 25 | 12). | 48 x 25 | 13). | 96 x 25 | 14). | 72 x 25 | 15). | 68 x 25 |
| 16). | 21 x 25 | 17). | 13 x 25 | 18). | 37 x 25 | 19). | 18 x 25 | 20). | 34 x 25 |
| 21). | 45 x 25 | 22). | 38 x 25 | 23). | 19 x 25 | 24). | 35 x 25 | 25). | 47 x 25 |
| 26). | 61 x 25 | 27). | 82 x 25 | 28). | 55 x 25 | 29). | 78 x 25 | 30). | 91 x 25 |

B. We can use this skill when multiplying by multiples of 25.

E.g. 1. 28 x 75 = 28 x 25 x 3 = 700 x 3 = 2100.
E.g. 2. 21 x 125 = 21 x 25 x 5 = 525 x 5 = 2625.

Use this method to calculate the following:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1). | 40 x 75 | 2). | 36 x 75 | 3). | 48 x 75 | 4). | 52 x 75 | 5). | 64 x 75 |
| 6). | 32 x 75 | 7). | 88 x 75 | 8). | 56 x 75 | 9). | 72 x 75 | 10). | 96 x 75 |
| 11). | 16 x 125 | 12). | 28 x 125 | 13). | 44 x 125 | 14). | 84 x 125 | 15). | 92 x 125 |
| 16). | 24 x 175 | 17). | 12 x 175 | 18). | 68 x 175 | 19). | 32 x 175 | 20). | 76 x 175 |
| 21). | 24 x 225 | 22). | 44 x 225 | 23). | 16 x 275 | 24). | 12 x 325 | 25). | 28 x 375 |

C. We can find square roots of perfect squares by pairing up prime factors.

E.g. $\sqrt{144}$. Find the prime factors.

| | |
|---|---|
| 2 | 144 |
| 2 | 72 |
| 2 | 36 |
| 2 | 18 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Now pair up the prime factors.

144 = 2x2 x 2x2 x 3x3

So $\sqrt{144} = \sqrt{2x2 \times 2x2 \times 3x3}$

$= 2 \times 2 \times 3 = 12$.

Use this method to calculate these questions.
(You may know the answers to some questions, but use this method anyway).

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1). | 81 | 2). | 196 | 3). | 625 | 4). | 484 | 5). | 1024 |
| 6). | 324 | 7). | 784 | 8). | 256 | 9). | 1444 | 10). | 441 |
| 11). | 225 | 12). | 729 | 13). | 576 | 14). | 676 | 15). | 1225 |
| 16). | 2116 | 17). | 1089 | 18). | 1936 | 19). | 4096 | 20). | 6561 |

Difficult:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 21). | 3136 | 22). | 3025 | 23). | 5184 | 24). | 9801 | 25). | 8281 |

D. Does $\sqrt{49} + \sqrt{36} = \sqrt{49 + 36}$ ?
Investigate for other numbers.

E. We can find cube roots of perfect cubes by tripling up prime factors.

E.g. $\sqrt[3]{216}$ Find the prime factors.

| | |
|---|---|
| 2 | 216 |
| 2 | 108 |
| 2 | 54 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Now triple up the prime factors.
216 = 2x2x2 x 3x3x3

So $\sqrt[3]{216} = \sqrt[3]{2x2x2 \times 3x3x3}$

$= 2 \times 3 = \underline{6}$.

Use this method to calculate these questions.
(You may know the answers to some questions, but use this method anyway).

1). $\sqrt[3]{729}$ 2). $\sqrt[3]{512}$ 3). $\sqrt[3]{4096}$ 4). $\sqrt[3]{10648}$ 5). $\sqrt[3]{1728}$

6). $\sqrt[3]{5832}$ 7). $\sqrt[3]{2744}$ 8). $\sqrt[3]{17576}$ 9). $\sqrt[3]{3375}$ 10). $\sqrt[3]{32768}$

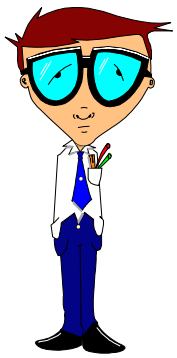
11). $\sqrt[3]{13824}$ 12). $\sqrt[3]{21952}$ 13). $\sqrt[3]{9261}$ 14). $\sqrt[3]{15625}$ 15). $\sqrt[3]{39304}$

F. Prime factors can help find Highest Common Factors and Lowest Common Multiples.

E.g. 1. Find the HCF of 480 and 420.
Find the prime factors.

| | |
|---|---|
| 2 | 480 |
| 2 | 240 |
| 2 | 120 |
| 2 | 60 |
| 2 | 30 |
| 3 | 15 |
| 5 | 5 |
| | 1 |

| | |
|---|---|
| 2 | 420 |
| 2 | 210 |
| 3 | 105 |
| 5 | 35 |
| 7 | 7 |
| | 1 |



480 = **2** x **2** x 2 x 2 x 2 x **3** x 5
420 = **2** x **2** x **3** x 7

The HCF is 2 x 2 x 3 = **12**.

Use this method to find the HCF of

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1). | 56 and 42 | 2). | 36 and 54 | 3). | 105 and 75 | 4). | 64 and 80 |
| 5). | 70 and 98 | 6). | 90 and 165 | 7). | 126 and 72 | 8). | 105 and 189 |
| 9). | 192 and 224 | 10). | 264 and 154 | 11). | 196 and 252 | 12). | 360 and 288 |
| 13). | 210 and 330 | 14). | 234 and 390 | 15). | 336 and 378 | 16). | 560 and 315 |

E.g. 2. Find the LCM of 8 and 12.
Find the prime factors.

| | |
|---|---|
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

| | |
|---|---|
| 2 | 12 |
| 2 | 6 |
| 3 | 3 |
| | 1 |

8 = 2 x 2 x 2
12 = 2 x 2 x 3

The LCM is 2 x 2 x 2 x 3 = **24**.

Use this method to find the LCM of

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17). | 6 and 9 | 18). | 20 and 8 | 19). | 6 and 15 | 20). | 16 and 12 |
| 21). | 12 and 15 | 22). | 18 and 30 | 23). | 15 and 24 | 24). | 9 and 16 |
| 25). | 36 and 48 | 26). | 20 and 24 | 27). | 42 and 48 | 28). | 36 and 28 |
| 29). | 56 and 32 | 30). | 48 and 88 | 31). | 120 and 96 | 32). | 124 and 160 |