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Cut and Paste Algebra

We are learning to solve more difficult multiplication problems including algebra using doubling and halving and trebling and thirding.

Exercise 1

Barry works out 5 x 8.6 by doubling 5 to make 10 and halving 8.6 to make 4.3 so that the answer is 43.
Use Brian's method to fill in the boxes.

1) 5 x 234000 = ☐ (2) 24.6 x 5 = ☐

(3) 528.4 x 5 = ☐

Exercise 2

Anita noticed that 2.5 x 3.6 can be calculated by multiplying 2.5 by 4 and dividing 3.6 by 4.
Use Anita's method to fill in the boxes.

1) 2.5 x 6.4 = ☐ (2) 4868 x 2.5 = ☐

3) 2.5 x 108 = ☐

Exercise 3

Sam showed that $3\frac{1}{3}$ x 27 can be calculated by multiplying $3\frac{1}{3}$ by 3 to make 10 and dividing 27 by 3 to give 9 and multiplying 10 by 9 to give 90 is an easy way to do this problem.

Use Sam's method to fill in the boxes.

1) $3\frac{1}{3}$ x 63 = ☐ (2) 297 x $3\frac{1}{3}$ = ☐

3) 639201 x $3\frac{1}{3}$ = ☐

Exercise 4

Alex noticed that he could generalise these methods as ak x $\frac{b}{k}$

Can you describe in words how this works?

☐

Using Alex's method you can easily calculate a number using the idea of doubling and halving or trebling and thirding. You can now decide whether these statements are true or false.
For each of the questions that are false write the correct statement.

1) 170 x 5 = 35 x 10	T F	(2) 360 x 2.5 = 90 x 10	T F
3) 108 x $3\frac{1}{3}$ = 12 x 10	T F	(4) 7.6 x 5 = 76 x 10	T F
5) 2390 x 5 = 23900 x 2.5	T F	(6) 18.4 x 5 = 9.2 x 10	T F
7) a x 2.5 = $\frac{a}{4}$ x 10	T F	(8) b x 5 = 10 x b	T F
9) $\frac{d}{10}$ x 2.5 = d x 10	T F	(10) 4f x 2.5 = f x 10	T F

Exercise 5

Sonia used Alex's method for division problems
140 divided 5 is the same as 70 divided by 10. Is this correct?
Can you work out a rule for division?

Use your method to decide whether the following problems are correct.

1) 140 ÷ 5 = 70 ÷ $2\frac{1}{2}$	T F	(2) 280 ÷ 10 = 14 ÷ 5	T F
3) 80 ÷ 20 = 20 ÷ 5	T F	(4) 84 ÷ 12 = 21 ÷ 3	T F
5) 360 ÷ 18 = 60 ÷ 3	T F	(6) 90 ÷ 18 = 10 ÷ 2	T F

Answers

Exercise 1

1) 10 x 117000 (2) 24.6 x 5 = 12.3 x 10 (3) 528.4 x 5 = 264.2 x 10

Exercise 2

1) 2.5 x 6.4 = 10 x 1.6 (2) 4868 x 2.5 = 1217 x 10 (3) 2.5 x 108 = 10 x 27

Exercise 3

1) $3\frac{1}{3}$ x 63 = 10 x 21 (2) 297 x $3\frac{1}{3}$ = 99 x 10 (3) 639201 x $3\frac{1}{3}$ = 213067 x 10

Exercise 4

Alex noticed that he could generalise these methods as ak x $\frac{b}{k}$

Can you describe in words how this works?

a x b x $\frac{x}{x}$ is the same as a x b x 1

1) 170 x 5 = 35 x 10 F (85 x 10) (2) 360 x 2.5 = 90 x 10 T

3) 108 x $3\frac{1}{3}$ = 12 x 10 F (36 x 10) (4) 7.6 x 5 = 76 x 10 F (3.8 x 10)

5) 2390 x 5 = 23900 x 2.5 F (1195 x 10) (6) 18.4 x 5 = 9.2 x 10 T

7) a x 2.5 = $\frac{a}{4}$ x 10 T (8) b x 5 = 10 x b F (10 x $\frac{b}{2}$)

9) $\frac{d}{10}$ x 2.5 = d x 10 F ($\frac{d}{40}$ x 10) (10) 4f x 2.5 = f x 10 T

Exercise 5

Sonia used Alex's method for division problems
140 divided 5 is the same as 70 divided by 10. Is this correct? No
Can you work out a rule for division?
Both numbers need to multipied or divided by the same number so 140 divided by 5 is the same as 280 divided by 10.

1) $140 \div 5 = 70 \div 2\frac{1}{2}$ T

(2) $280 \div 10 = 14 \div 5$ F $(140 \div 5)$

3) $80 \div 20 = 20 \div 5$ T

(4) $84 \div 12 = 21 \div 3$ T

5) $360 \div 18 = 60 \div 3$ T

(6) $90 \div 18 = 10 \div 2$ T