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6. (a) $(5 + 6) \cdot 3 = 33$ (b) $8 + 7 - 3 = 12$ None needed
 (c) $6 + 8 - 2 \div 2 = 13$ (d) $(9 + 6) \div 3 = 5$
 None needed

8. (a) $18 \div 3 = \boxed{6}$ (b) $\boxed{0} \div 76 = 0$ (c) $28 \div \boxed{4} = 7$

18. (a) $5 \cdot 8 = 40$ (b) $2x = 326$

19. (Answers will vary) Samples follow

(a) $(8 \div 4) \div 2 = 2 \div 2 = 1$ $8 \div (4 \div 2) = 8 \div 2 = 4$

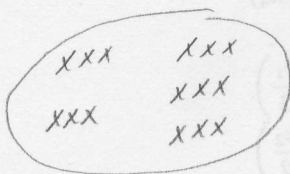
Hence division of whole numbers is not associative.

(b) $6 \div (1 + 2) = 6 \div 3 = 2$ $(6 \div 1) + (6 \div 2) = 6 + 3 = 9$

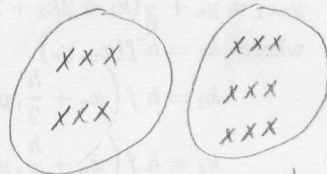
Hence there is not a distributive property of division over addition of whole numbers.

20. (a) (Answers will vary)

Sample $(6 + 9) \div 3 = (6 \div 3) + (9 \div 3)$



$$\begin{aligned} (6 + 9) \div 3 \\ = 15 \div 3 \\ = 5 \end{aligned}$$



$$\begin{aligned} (6 \div 3) + (9 \div 3) \\ = 2 + 3 \\ = 5 \end{aligned}$$

(b) $\left[\begin{array}{l} a \div c = y \text{ iff } a = cy \\ b \div c = z \text{ iff } b = cz \end{array} \right]$

Therefore $a + b = cy + cz$
 $a + b = c(y + z)$ iff $(a + b) \div c = y + z$

Therefore $(a + b) \div c = y + z = a \div c + b \div c$.

21. (a) $5x + 2 = 22$

$5x = 22 - 2$

$5x = 20$

$x = 20 \div 5$

$x = 4$

(b) $3x + 7 = x + 13$

$3x = x + 13 - 7$

$3x = x + 6$

$3x - x = 6$

$2x = 6$

$x = 6 \div 2$

$x = 3$

(c) $3(x + 4) = 18$

$x + 4 = 18 \div 3$

$x + 4 = 6$

$x = 6 - 4$

$x = 2$

22. Method I

Millie	3	6	9	12	15
Sam	5	10	15	20	25

Samantha will have saved \$10 more than Millie in 5 months.

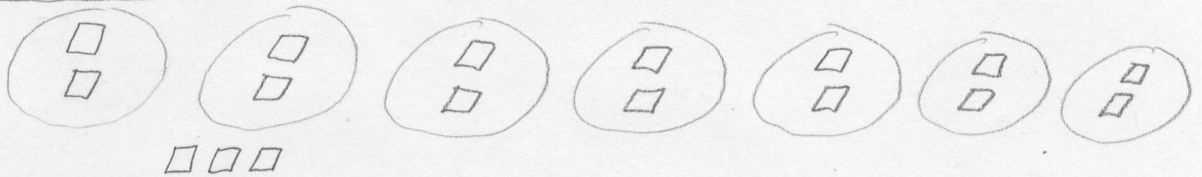
Method IILet N represent the number of months.

$5N = 3N + 10$

$2N = 10$

$N = 5$

Samantha will have saved \$10 more than Millie in 5 months.

23. Partition Model

$17 \div 7 = 2 R 3$

Each person would get two sandwiches and three sandwiches are left over.

27. Whole numbers that when divided by 10 have a remainder of 4.

$A = \{4, 14, 24, 34, 44, 54, 64, 74, 84, 94\}$

Whole numbers that when divided by 47 have a remainder of 17.

$B = \{17, 64\}$

$A \cap B = \{64\}$

Yes, the value is 64.

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28. (a) $5(16-7) - 18 = 5(9) - 18$

Subtract 18 from 45 last.

(b) $\frac{10-5+4}{54} = \frac{5+4}{54} = \frac{9}{54}$

Divide 54 by 9 last.

(c) $(14-3) + (24 \cdot 2) = 11 + 48$ Add 11 and 48 last.

(d) $\frac{26045}{345} + 8 = 61 + 8$ Add 61 and 8 last.

29. (a) $w = \frac{8}{f}$ (b) $y = \frac{3}{f}$ (c) $m = 604$ (d) $w = \frac{d}{7}$

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4. No, $0 \div 0$ is undefined. $0 \div 0 \neq 1$.

TIMSS

$2(8) = 16$

$8 + 16 = 24$

(d) Toshya's class has

24 students.

NAEP

$3 + 3 + N = 4(3)$

(a) $6 + N = 12$