

3.1 The Language of Algebra

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- #21. The difference of x and 9. $x - 9$
- #22. The sum of 12 and p . $12 + p = p + 12$
- #23. Two-thirds of the population p . $\frac{2}{3}p = \frac{2p}{3}$
- #24. The product of x and 34. $34x$
- #25. r added to six. $r + 6 = 6 + r$
- #26. The ratio of i to 100. $i : 100 = \frac{i}{100}$
- #27. 15 less than d . $d - 15$
- #28. Forty increased by w . $40 + w = w + 40$
- #29. s subtracted from 1. $1 - s$
- #30. Sixteen minus a . $16 - a$
- #31. Twice the price p . $2p$
- #32. T reduced by 50. $T - 50$
- #33. Exceeds the standard s by 14. $s + 14$
- #34. The cost c split five equal ways. $\frac{c}{5} = c \div 5$
- #35. 35 divided by b . $\frac{35}{b}$
- #36. The total of 5 and 12 and q . $5 + 12 + q$
- #37. x decreased by 2. $x - 2$
- #38. 7 more than the average a . $a + 7 = 7 + a$
- #43. a. How many seconds are there in m minutes?

m	seconds: s
1	1•60
2	2•60
3	3•60
10	10•60
m	$m \cdot 60 = 60m$

$60m$

b. In h hours?

h	minutes	seconds: s
1	60	1•60•60
2	2•60	2•60•60
3	3•60	3•60•60
10	10•60	10•60•60
h	$h \cdot 60$	$h \cdot 60 \cdot 60$

h	seconds: s
1	1•3600
2	2•3600
3	3•3600
10	10•3600
h	$h \cdot 3600 = 3600h$

Answer: $3600h$

#44. A man sleeps x hours per day.

a. How many hours does he sleep in a week? $7x$

x	hours per week (7 days)
4	$4 \cdot 7$
7	$7 \cdot 7$
8	$8 \cdot 7$
11	$11 \cdot 7$
x	$7x$

b. In a year?

If he sleeps $7x$ hours per week, there are 52 weeks in a year, so the number of hours he sleeps in a year is $364x$

Number of weeks	Number of sleeping hours
1	$1 \cdot 7x$
2	$2 \cdot 7x$
5	$5 \cdot 7x$
26	$26 \cdot 7x$
52	$52 \cdot 7x = 364x$

#45. A secretary earns an annual salary of s dollars.

a. Express her salary per month. $\frac{s}{12}$

b. Express her salary per week? $\frac{s}{52}$

#46. A store manager earns d dollars an hour.

a. How much money will he earn in an 8-hour day? $8d$

b. In a 40-hour week? $40d$

#47. A rope is f feet long.

a. Express its length in inches. $12f$

b. Express its length in yards. $\frac{f}{3}$

#48. A chain is y yards long.

a. Express its length in feet. $3y$ feet

1 yard is the same as 3 feet.

1 foot is the same as 12 inches.

Yards	Feet	Inches
1	1·3	$\boxed{1 \cdot 3} \cdot 12$
2	2·3	$\boxed{2 \cdot 3} \cdot 12$
5	5·3	$\boxed{5 \cdot 3} \cdot 12$
7	7·3	$\boxed{7 \cdot 3} \cdot 12$
y	$y \cdot 3 = 3y$	$\boxed{y \cdot 3} \cdot 12 = 3 \cdot 12 \cdot y = 36y$

b. Express its length in inches. $3y \cdot 12 = 36y$ inches

#50. A couple needed to purchase 21 presents for friends and relatives on their holiday gift list. If the husband purchased g presents, how many presents did the wife need to buy?

$$21 - g$$

purchased	To be purchased
12	$21 - 12$
7	$21 - 7$
g	$21 - g$

The number of presents to be purchased by the wife is the difference of 21 and the number purchased by the husband.

the difference of 21 and g

#52. The height of a hedge was f feet before a gardener cut 2 feet off the top. What was the height of the trimmed hedge?

Answer: the height of the trimmed hedge is the difference of f and 2. That is, $f - 2$.

#53. 15 pages/day

number of pages in the yellow pad	days to last
$p = 30$	$\frac{30}{15} = 2$ days
$p = 45$	$\frac{45}{15} = 3$ days
p	$\frac{p}{15}$ days

The number of days is the total number of pages p divided by 15.

The number of days is the quotient of p and 15.

#54. The projected cost c (in dollars) of a freeway was too low by a factor of 10! What

was the actual cost of the freeway?

10c

#56. A graduating class of x people took buses that held 40 students each to an all-night graduation party. How many buses were needed to transport the class?

$$\frac{x}{40} = \frac{\text{Total number of people}}{\text{the number of seats per bus}}$$