



8. a)  $0.305 = \frac{305}{1000} = \frac{61}{200}$

$100x = 21.212121\dots$

b)  $- x = 0.212121\dots$

$$\begin{array}{r} 100x = 21.212121\dots \\ - x = 0.212121\dots \\ \hline 99x = 21 \end{array} \Rightarrow x = \frac{21}{99} = \frac{7}{33}$$

$10x = 2.7777\dots$

c)  $- x = .2777\dots$

$$\begin{array}{r} 10x = 2.7777\dots \\ - x = .2777\dots \\ \hline 9x = 2.5 \end{array} \Rightarrow x = \frac{2.5}{9} = \frac{2.5 \times 10}{9 \times 10} = \frac{25}{90} = \frac{5}{18}$$

d)  $0.12\% = \frac{0.12}{100} = \frac{0.12 \times 100}{100 \times 100} = \frac{12}{10000} = \frac{3}{2500}$

9. a) 30%                      b) 5400%

c)  $\frac{7}{8} = \frac{n}{100} \Rightarrow 8n = 700 \Rightarrow n = \frac{700}{8} = 87.5$  So,  $\frac{7}{8} = 87.5\%$

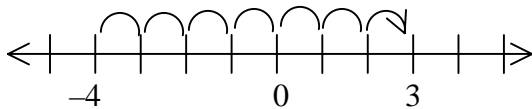
d)  $\frac{2}{11} = \frac{n}{100} \Rightarrow 11n = 200 \Rightarrow n = \frac{200}{11} = 18\frac{2}{11}$  So,  $\frac{2}{11} = 18\frac{2}{11}\%$

10. a) 600.054                      b) 0.654

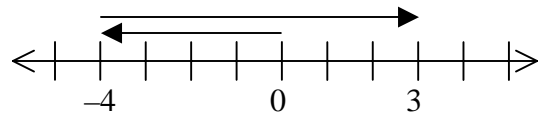
11. a) six thousand and seven hundredths  
 b) ninety-seven millionths

12. a)  $-4 + 7$

number line

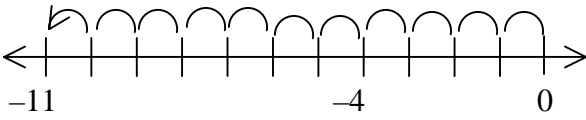


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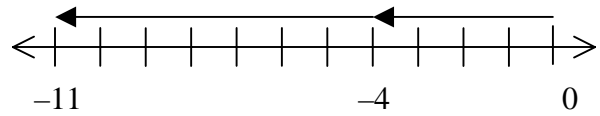


b)  $-4 + (-7)$

number line

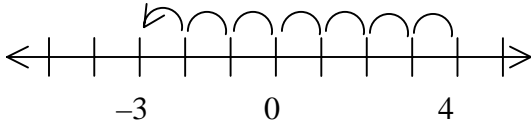


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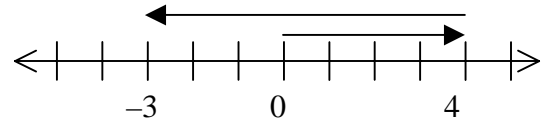


c)  $4 + (-7)$

number line



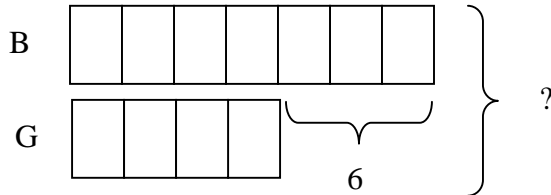
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13. see text for sample chip models

14. a) Bar diagram:

3 units = 6  
1 unit = 2  
11 units = 22



There are 22 students in the class.

Algebra:

Let  $x$  be the number of girls.

$x + 6$  is the number of boys.

$$\frac{x+6}{x} = \frac{7}{4} \Rightarrow 7x = 4(x+6) \Rightarrow 7x = 4x+24$$

$$\Rightarrow 3x = 24 \Rightarrow x = 8$$

So, there are 8 girls and  $8 + 6 = 14$  boys, for a total of 22 students.

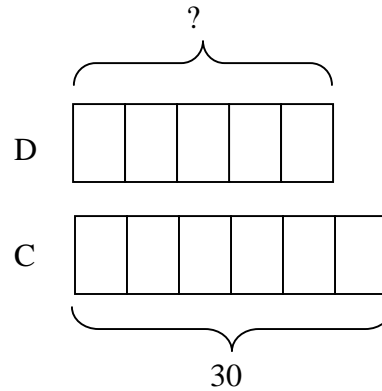
b) Bar diagram:

$$6 \text{ units} = 30$$

$$1 \text{ unit} = 5$$

$$5 \text{ units} = 25$$

There are 25 dogs.



Algebra:

Let  $d$  be the number of dogs.

$$\frac{6}{5} = \frac{30}{d} \Rightarrow 6d = 150 \Rightarrow d = \frac{150}{6} = 25$$

There are 25 dogs.

15. a) Let  $x$  be the common factor.

$4x$  is Manny's earnings

$3x$  is Moe's earnings

$5x$  is Jack's earnings

$$4x + 3x + 5x = 1524$$

$$12x = 1524$$

$$x = 127$$

$$5x = 5(127) = 635$$

Jack earned \$635.

b) Let  $x$  be the common factor

$3x$  is one number and  $5x$  is the other number

$$\frac{3x-11}{5x-11} = \frac{2}{7} \Rightarrow 7(3x-11) = 2(5x-11) \Rightarrow 21x-77 = 10x-22$$

$$\Rightarrow 11x = 55 \Rightarrow x = 5$$

So, the two numbers are  $3(5) = 15$  and  $5(5) = 25$ .

16. Original bag had 6 white and 10 red. After 4 white and 20 red are added – there are now 10 white and 30 red marbles. The ratio of white to red is 10:30 or 1:3.

17. The mark-up is \$3. The question we must ask is 3 is what percent of 20?

$$\frac{3}{20} = \frac{n}{100} \Rightarrow 20n = 300 \Rightarrow n = 15$$

So, the mark-up is 15%

18. 35% off means the sale price is 65% of the original.  
The question we must ask is \$390 is 65% of what?

$$\frac{390}{x} = \frac{65}{100} \Rightarrow 65x = 39000 \Rightarrow x = 600$$

The price of the sofa originally was \$600.

19. The questions we must ask is Justin's savings is what percent of David's savings?  
Or, 580 is what percent of 500?

$$\frac{580}{500} = \frac{n}{100} \Rightarrow 500n = 58000 \Rightarrow n = 116$$

So, Justin's savings is 116% of David's.

20. A 30% reduction means that you pay 70% of the original price.  
A 10% further reduction means that you pay 90% of the reduced price.  
So, 90% of 70% is  $0.9 \times 0.7 = 0.63$  or 63% of the original  
which means a reduction of 37%..

21. tripled – see text for diagram

22. B is the better deal – A represents a total mark-down of 36% where B is a mark-down of 40%