

# Grade 9

## NUMBER SENSE AND ALGEBRA: ALGEBRAIC EXPRESSIONS & EQUATIONS

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### Answers:

1. a.  $12 + 9$     b.  $4 \times 5$     c.  $7 - 6$     d.  $xy$     e.  $w - 4$     f.  $\frac{x}{y}$

2. a. 14    b. 30    c. 18    d. 2    e. -10    f. 46

3. a. 16    b. 44    c. -3    d. 9    e. 0    f. 32

4. a.  $4a + 11$     b.  $5w$     c.  $2r + 5s + 22$   
d.  $3x + 5y + 13$     e.  $7p - q + 3$     f.  $7c - 10d + 9$

5. a. earnings =  $\$17n$     b.  $\$17(7) = \$119$

6. a. distance =  $s \times t$     b. distance =  $(80 \text{ km/h}) \times (4.5 \text{ h}) = 360 \text{ km}$

7. a. The Raptors scored:  $8x + 41y + 17z = 8(3) + 41(2) + 17(1) = 123$   
The Lakers scored:  $6x + 43y + 14z = 6(3) + 43(2) + 14(1) = 118$   
Therefore, the Raptors won the game.  
b. The Raptors scores 41 2-point shots.

8. Speed =  $\frac{\text{total distance travelled}}{\text{time}}$   

$$= \frac{4200 \text{ m} + 600 \text{ m}}{2 \text{ min}}$$

$$= \frac{4800 \text{ m}}{120 \text{ sec}}$$

$$= 40 \text{ m/sec}$$

Therefore, the speed of the train is 40 m/sec.

9. Let  $x$  represent the total cost of the shares. Then, each of the 4 members paid  $\frac{x}{4}$ . When the 2 new members are added to the club, the new cost per share for the original members

is  $\frac{x}{6} + 200$  each. Therefore,

$$\frac{x}{4} = \frac{x}{6} + 200$$

$$3x - 2x = 2400$$

$$x = 2400$$

Thus, the shares cost \$2400.

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Since all the distances given are in meters, and the speeds of guys are in kilometre, change the distances to be in kilometres.

10. Using  $\text{time} = \frac{\text{distance}}{\text{speed}}$

		Distance (km)	Speed (km/h)	Time (h)	Time (min)
James	Bike	3	21.6	$0.13\bar{8}$	$8.\bar{3}$
	Run	1.5	7.2	$0.208\bar{3}$	12.5
	Swim	0.6	3.6	$0.1\bar{6}$	10
Troy	Bike	3	18	$0.1\bar{6}$	10
	Run	1.5	9	$0.1\bar{6}$	10
	Swim	0.6	5.4	$0.\bar{1}$	$6.\bar{6}$

- The quickest method for James is to bike and the quickest for Troy is to swim.
- Troy would win the race. It would take him 13 minutes and 20 seconds to swim both ways.

11. Let  $v$  represent the volume of the sink.  
Flow rate is measured in volume per second.  
fill rate = Flow rate in – Flow rate out

$$= \frac{v}{60} - \frac{v}{80} = \frac{v}{240}$$

Therefore, it would take 240 seconds to fill the sink.

12. For the father to be 4 times as old as his son, the sum of their ages has to be a multiple of 5. Therefore, you have to add 2 to 33. Both have aged 1 year.  
[Therefore, at present the father is 27 and the son is 6. In 1 year the father will be 28 and the son will be 7, so the father will be 4 times as old as his son.]