**Essential Maths 3 Solving Problems**

1. Which one of the following is not true of an equation?
   1. It gives a symbolic representation of a problem
   2. It contains an equals sign
   3. It is complex and difficult to solve
   4. It is used to help solve problems
2. What is the average speed (s) of a car travelling a distance d kilometres in a time of t hours?
   1. s = d/t
   2. s = dt
   3. s = t/d
   4. s = dt2
3. What is the equation for the amount of tax (T) to be paid at a rate of R percent on a salary of €S, and a tax free allowance of €8000?
   1. T = (S - 8000)×R
   2. T = RS – 8000
   3. T = R(S + 8000)
   4. T = R(S – 8000)/100

1. In the last question, how much tax is paid on a salary of €40,000 and a tax rate of 30 percent?
   1. €2400
   2. €4000
   3. €9600
   4. €12000
2. What does ‘solving’ an equation mean?
   1. finding an unknown value from some known values
   2. confirming an estimated value
   3. finding one unknown value from a set of other unknown values
   4. writing an equation in the simplest form
3. I am twice my son’s age and two-thirds my mother’s age. Our combined age is 108 years. Write an equation to help find my age (x).
   1. x/2 + x + 3x/2 = 108
   2. 2x + x + 2x/3 = 108
   3. x + 2x + 3x/2 = 108
   4. x/2 + x + 2x/3 = 108
4. If the equation x/2 + x + 3x/2 = 108 shows the combined age of myself, my son and my mother, what is my age (where x is my age)?
   1. 49
   2. 29
   3. 36
   4. 42
5. If y = 5x – 12 Is x:
   1. always bigger than y
   2. always smaller than y
   3. sometimes bigger and sometimes smaller than y
   4. we cannot tell which is bigger
6. Solve 2y/(y-3) + (y+2)/(y-3) = 4
   1. y = 5
   2. y = 14
   3. y = 2/3
   4. y = 2
7. Solve 3x/(x-1) = 1 + 3/(x-1)
   1. x = 4/3
   2. x = 1
   3. There is no solution
   4. x = 3
8. If y = x/(z – 2) what is (y)when x =12 and z = 2?
   1. 3
   2. 6
   3. 12
   4. There is no answer
9. Rearrange 4x = √(2y – 5) + z with y as the subject
   1. y = 1/2(4x – z)2 + 5/2
   2. y = 8x2 – z/2 + 5/2
   3. y = 16x – z/2 + 5
   4. y = 1/5(4x – z)2 + 2
10. If y = ax + b, which of the following is not true?
    1. ax = y – b
    2. x = (y – b)/a
    3. a = (b + y)/x
    4. b = y – ax
11. If t = √(s2 + 1), simplify (t2 – s2)/[t2 – (s + 1)(s – 1)]
    1. t2 + 1
    2. 1/2s2
    3. s2 – 1
    4. ½
12. What is meant by ‘a ≤ b’
    1. a is always less than b
    2. a is sometimes less than b
    3. a is always less than or equal to b
    4. b is always less than or equal to a
13. Demand for a product is equal to 1500 – 0.25P, where P is the price of a unit. Supply of the product is 1000 + P. What does it mean when there is equilibrium in the market for the product?
    1. 1500 – 0.25P = 1000 + P
    2. 1500 – 0.25P ≠ 1000 + P
    3. 1500 – 0.25P > 1000 + P
    4. 1500 – 0.25P < 1000 + P
14. Demand for a product is equal to 1500 – 0.25P, where P is the price of a unit. Supply of the product is 1000 + P. If there is equilibrium int he market for the product (i.e. 1500-0.25P=1000+P), what is the equilibrium price?
    1. 200
    2. 400
    3. 1000
    4. 2000
15. Rearrange z < 2a/b with b as the subject assuming b > 0
    1. b > 2a/z
    2. b < 2a/z
    3. b < 2a - z
    4. b > 2a - z
16. If y < x – 2 what can you say about –y?
    1. –y < x – 2
    2. –y < -x - 2
    3. –y < -x + 2
    4. –y > -x + 2
17. Solve x – y < 4 + y < z + x for x
    1. 4 < x < z + y
    2. 4 – z < x < 2y
    3. 4 + y – z < x < 4 + 2y
    4. y – 4 < x < z + 2y
18. A family’s net income (N) has to cover housing (H), living (L) and other expenses (O) What can you say about N?
    1. N < H + L + O
    2. N > H + L + O
    3. N ≥ H + L + O
    4. N ≥ HLO
19. John would like to set up a badminton club for himself and some friends. The badminton court will cost £24 for the evening and he estimates that they will use an average of 3 feather shuttlecocks per player per evening. The shuttlecocks cost £8 per dozen. He and his friends will share the costs equally but are not willing to spend more than £5 per person per evening. At least how many players should John ask to join him?
    1. 7
    2. 6
    3. 9
    4. 8
20. One food supplement contains 3 g of protein in 10 g of weight, while another contains and 4 g of protein in 10 g of weight. If someone is put on a diet consisting only of x grams of the first supplement and y grams of the second, and they must eat a minimum of 30 g of protein, what can you say about the amount they eat?
    1. x + y ≥ 30
    2. 0.3x + 0.4y > 30
    3. 0.3x + 0 4y ≥ 30
    4. 30x + 40y ≥ 30

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| Question | Answer |
| 1 | C |
| 2 | A |
| 3 | D |
| 4 | C |
| 5 | A |
| 6 | A |
| 7 | C |
| 8 | C |
| 9 | B |
| 10 | B |
| 11 | D |
| 12 | B |
| 13 | C |
| 14 | D |
| 15 | C |
| 16 | A |
| 17 | B |
| 18 | B |
| 19 | D |
| 20 | C |
| 21 | C |
| 22 | D |
| 23 | C |