**Essential Maths 4 Modelling Using Straight Lines**

1. At what value of y does 4x – 3y = 8 cut the y-axis?
   1. -8/3
   2. 8/3
   3. -3/4
   4. -3/8
2. Where does the line x = 6 cross the y axis?
   1. x = 0
   2. x = 6
   3. x = -6
   4. It does not cross the y axis
3. Which of the following points does the line y -3x + 7 = 0 pass through?
   1. (0, 0)
   2. (1, -4)
   3. (2, 3)
   4. (3, -2)
4. A straight line goes through the point (1,2) and crosses the y-axis at y = -1. Which of the following point is on this line?
   1. (4,11)
   2. (2,6)
   3. (6,15)
   4. (-2,-5)
5. What is the gradient of the line y = -10?
   1. -10
   2. 1
   3. 0
   4. 10
6. What is the gradient of the line 3x – 7y = 14?
   1. -2
   2. 7/3
   3. 3/7
   4. -1/2
7. Which of the following lines has a gradient of – 2/3?
   1. 6x – 2 = 3y
   2. -15y – 5 = 10x
   3. 8 – 2y = 3x
   4. -x + 3 = 2y
8. What does a negative gradient mean?
   1. the line is parallel to the x axis
   2. the line is parallel to the y axis
   3. the line slopes upwards toward the right
   4. the line slopes downwards towards the right
9. Do the three points (6,6), (5,5) and (7,3) lie on a straight line?
   1. yes
   2. no
   3. there is not enough information to say
10. Complete the following sentence. Parallel lines have:
    1. the same gradient and same point of intersection with the y-axis
    2. different gradients but the same point of intersection with the y-axis
    3. different gradients and a different point of intersection with the y-axis
    4. the same gradient but a different point of intersection with the y-axis
11. Demand for a product is equal to 4500 – 0.75P, where P is the price of a unit. Supply of the product is 1000 + P. What does the equilibrium price mean?
    1. the demand line must always be above the supply line
    2. the supply line must always be above the demand line
    3. the two lines are parallel
    4. the two lines cross at the equilibrium price
12. In the previous question, what are the equilibrium price and corresponding supply?
    1. 12000 and 15000
    2. 8000 and 9000
    3. 2000 and 3000
    4. 200 and 2100
13. What does it mean if the lines of simultaneous equations do not cross each other?
    1. there is a mistake in the equations
    2. there is no solution
    3. there is only one solution
    4. there are many solutions
14. Solve the following pair of linear equations; 3x + y = 8, 4x – 2y = 4
    1. x = 3, y = -1
    2. x = 2, y = 2
    3. x = 1, y = 0
    4. x = 2, y = -2
15. Solve the following pair of linear equations; x – 2y = 6, 3x – 4 = 6y
    1. There is no solution
    2. There are many solutions
    3. x = 2, y = 0
    4. x = 4, y = -1
16. Solve the following pair of linear equations; 8x + 6y = 12, y = - 4x/3 +2
    1. x = 3, y = 2
    2. x = 4, y = -2/3
    3. There are many solutions
    4. There is no solution
17. If the supply equation is P = 10 + 0.5Q and the demand equation is Q = 200 – 2P, what is the equilibrium price and quantity?
    1. P = 45, Q = 70
    2. P = 75, Q = 130
    3. P = 35, Q = 50
    4. P = 55, Q = 90
18. What shape is the curve x2 + x – 2?
    1. a straight line
    2. a ‘U’ shape
    3. an inverted ‘U’ shape
    4. a more complex curve
19. Where does the curve in the last question cross the x axis?
    1. when x = 0
    2. when x = -2 and x = 1
    3. when x = 2 and x = -1
    4. It does not cross the x axis
20. If sales are constrained by the equation S ≤ 10 - 2x (where x is the availability of a scarce resource) what are the greatest feasible sales?
    1. 0
    2. 2
    3. 10
    4. there is no limit on sales
21. If sales are constrained by the equation S ≤ 10 - 2x (where x is the availability of a scarce resource), what shape is the feasible region for sales?
    1. there is no feasible region
    2. at the origin
    3. a straight line through the points (5,0) and (0,10)
    4. a triangle with vertices as (0, 0), (0, 10) and ( 5, 0)

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