# GRAPHICAL INEQUALITIES

Answer all questions. Show your working.

## MAIN TASK

1. $y > 2x + 1, y < 4, x > -1$
2. $y \ -x + 3, y \ 0, x \ 2$
3. $y \ 3x - 2, y \ x + 4, x \ 0$
4. $y < 0.5x + 2, y > -x + 1, x < 3$
5. $y \ -2x + 5, y \ 3, x \ 1$
6. $y > x - 1, y < 2x + 2, x \ 4$
7. $y \ 4x - 3, y \ -x + 2, x \ -2$
8. $y < 3, y > -2x + 1, x > -3$
9. $y \ x, y \ 2x + 1, x \ 5$
10. $y > -3x + 4, y < x + 5, x \ 0$
11. $y \ 2, y \ x - 3, x \ 3$
12. $y > -2, y < 0.5x + 1, x \ -4$
13. $y \ -x + 2, y \ 3x - 1, x \ 1$
14. $y < 4x - 2, y > -3x + 5, x \ 2$
15. $y \ 0, y \ -x + 6, x \ -1$
16. $y > x + 1, y < 3x - 1, x \ 4$
17. $y \ 5, y \ 2x - 3, x \ 0$
18. $y < -x + 4, y > x - 2, x \ 3$
19. $y \ -2x + 3, y \ x + 2, x \ -2$
20. $y > 0, y < 4x + 1, x \ -1$
21. $y \ x + 3, y \ -x - 1, x \ 2$
22. $y > -3x + 2, y < 2x - 1, x \ 1$
23. $y \ -1, y \ 0.5x + 2, x \ 4$
24. $y < x + 5, y > -2x + 3, x \ 0$
25. $y \ 2x - 4, y \ -x + 5, x \ -3$
26. $y > -4, y < 3x + 2, x \ 3$
27. $y \ 3x - 2, y \ -2x + 1, x \ 0$
28. $y < 5, y > x - 3, x \ 6$
29. $y \ -0.5x + 1, y \ 2x + 3, x \ -2$
30. $y > x - 4, y < -x + 6, x \ 5$

## MASTERY OF MATHEMATICS

1. A farmer has a field where he grows two crops, A and B. The profit from crop A is £2 per unit and from crop B is £3 per unit. The inequalities y  -x + 6, y  2x + 2, and x  0 represent the constraints on the units of crops A and B he can grow. What is the maximum profit?

2. A shop sells two types of pens, X and Y. The cost constraints are given by y  x - 2, y  -0.5x + 5, and x  0. If pen X costs £1 and pen Y costs £2, what is the minimum total cost?

3. A garden has a rectangular lawn with constraints y  1, y  4, x  0, and x  3. What is the area of the lawn?

4. A company produces two products, P and Q. The production constraints are y  x + 3, y  -2x + 8, and y  0. If product P sells for £5 and product Q for £3, what is the maximum revenue?

5. A student has study time constraints given by y  -x + 4, y  x + 2, and x  0. If the student needs at least 3 hours of study, what is the feasible region?

6. A bakery makes cakes and pastries. The constraints are y  2x + 4, y  -x + 6, and y  0. If cakes cost £4 and pastries £2, what is the maximum number of items they can make with a budget of £20?

7. A car park has constraints y  -x + 3, y  x + 1, and x  0. What is the maximum number of cars that can be parked if x and y must be integers?

8. A factory produces two goods with constraints y  0.5x - 1, y  -x + 7, and x  0. If the profit is £2 per unit for good A and £1 per unit for good B, what is the maximum profit?

9. A school trip has constraints y  3x + 2, y  -2x + 10, and y  0. If each student costs £10 and each teacher costs £20, what is the minimum cost for the trip?

10. A sports club has training constraints y  x - 3, y  -0.5x + 6, and x  0. If each session costs £5 for members and £10 for non-members, what is the maximum cost?