ILLAWARRA TUTORING

In this worksheet you will develop your ability to formulate the equation of a line given specific conditions. You will practise finding the equation when provided with a gradient and intercepts, a point and a gradient, or two points. Read each question carefully and show all your work.

Easy Questions

1. Find the equation of the line with gradient 2 and y-intercept 3.
2. Find the equation of the line that passes through $(0, -1)$ with gradient 4.
3. Determine the equation of the line passing through $(2, 5)$ with gradient 1.
4. Write the equation of the line with y-intercept -2 that passes through $(4, 0)$.
5. Find the equation of the horizontal line passing through $(3, 7)$.

Intermediate Questions

6. Given the points $(1, 2)$ and $(3, 6)$, find the equation of the line.
7. Find the equation of the line parallel to $y = 2x + 1$ that passes through $(4, -3)$.
8. Find the equation of the line perpendicular to $y = \frac{1}{2}x - 7$ and passing through $(2, 3)$.
9. Find the equation of the line passing through $(-1, 2)$ with gradient -3.
10. Find the equation of the line with gradient $\frac{3}{4}$ that has an x-intercept at 8.
11. A line has y-intercept 5 and is parallel to the line joining $(2, -1)$ and $(3, 1)$. Find its equation.
12. Determine the equation of the line passing through $(0, 3)$ and $(4, 11)$.
13. Determine the equation of the line that passes through $(-2, -3)$ with gradient 2.
14. Find the equation of the line passing through $(5, 6)$ and $(7, 10)$.
15. A line passes through $(-3, 0)$ with gradient 1. Write its equation.

16. Find the equation of the line that passes through $(2, 3)$ with gradient -2.

17. Determine the equation of the line passing through $(-4, -1)$ and $(2, 5)$.

18. Find the equation of the line parallel to $y = x - 3$ that has y-intercept 2.

19. Find the equation of the line with gradient $-\frac{5}{3}$ that passes through $(3, 0)$.

20. A line passes through $(0, -8)$ and $(4, 0)$. Determine its gradient and write its equation.

Hard Questions

21. A line bisects the segment joining $(2, -1)$ and $(6, 7)$ and is perpendicular to the segment. Find its equation.

22. Find the equation of the line that passes through the intersection of $y = 2x + 3$ and $y = -x + 1$ and has gradient 3.

23. A line is given by $y - 2 = 5(x - 1)$. Rewrite this equation in the form $y = mx + b$ and state the gradient and y-intercept.

24. A line passes through $(-2, 8)$ and $(4, -4)$. Determine its gradient and equation in the form $y = mx + b$.

25. The line $y = -3x + b$ passes through $(-1, 2)$. Find b and write the complete equation.

26. A line has a gradient three times that of $y = \frac{1}{3}x + 7$ and passes through $(3, 4)$. Find its equation.

27. Consider the line $y = mx - 2$. If it passes through $(3, 1)$, determine the value of m and hence write the equation.

28. Given the line $y + 4 = 2(x - 3)$ and the line $y - 2 = k(x + 1)$ are parallel, find the value of k and write the equation of the second line.

29. Rearrange the equation $2y - 3x = 7$ to the form $y = mx + b$ and state the gradient and y-intercept.

30. A line has a y-intercept of 5 and an x-intercept of -3. Determine its gradient and write its equation.