ILLAWARRA TUTORING

In this worksheet you will develop your ability to formulate the equation of a line given specific conditions. You will use different forms including point-slope, slope-intercept and standard form. Work through the questions to practise finding the equation of a line from various pieces of information.

Easy Questions

1. Find the equation of the line with gradient 3 that passes through $(2, 4)$.
2. Find the equation of the line passing through $(1, 2)$ and $(3, 6)$.
3. A line is given in point-slope form by $y - 5 = 2(x - 3)$. Write the equation in slope-intercept form.
4. Write the equation of the line with gradient -2 that passes through $(0, 5)$.
5. Find the equation of the line with gradient 1 which passes through $(-3, 2)$.

Intermediate Questions

6. Find the equation of the line with gradient 3 that passes through $(4, 7)$. Express your answer in both point-slope and slope-intercept forms.
7. Find the equation of the line with gradient $\frac{1}{3}$ that passes through $(0, -2)$. Then use the equation to determine y when $x = 9$.
8. A line passes through $(-2, 3)$ and has gradient -4. Write its equation in point-slope form and then convert it to slope-intercept form.
9. Find the equation of the line through $(5, -1)$ with gradient $\frac{2}{5}$. Then find its x-intercept.
10. A line has gradient $-\frac{3}{4}$ and passes through $(8, 6)$. Write the equation of the line and determine its y-intercept.
11. Find the equation of the line passing through $(3, -2)$ and $(7, 6)$.
12. Determine the equation of the line if its gradient is 5 and its y-intercept is 3.
13. A line passes through $(0, 0)$ and $(4, 10)$. Find its equation.

14. Find the equation of the line that passes through $(6, 2)$ and has gradient -1.

15. The equation $y - 9 = -2(x - 4)$ represents a line. Convert this equation to slope-intercept form and determine its x-intercept.

16. Given a line with gradient 7 that passes through $(3, -5)$, find its equation and state the coordinates of its y-intercept.

17. Find the equation of the line determined by the points $(-3, 4)$ and $(1, -4)$.

18. Find the equation of the line with gradient $\frac{1}{2}$ that passes through $(-10, 0)$.

19. Determine the gradient and y-intercept of the line given by $y - 2 = 4(x - 1)$.

20. A line passes through $(2, 3)$ and another point $(6, 11)$. Find the gradient and write the equation of the line.

Hard Questions

21. A line with gradient k passes through $(2, 1)$ and $(-3, y)$ and has a y-intercept equal to 5. Determine k and the value of y, and hence write the equation of the line.

22. A line is defined such that the sum of its x-intercept and y-intercept equals 4. If the line has gradient 2, find its equation.

23. Determine the equation of a line whose y-intercept is triple its x-intercept and that passes through $(4, 8)$.

24. The line given by $4y - 3x = 12$ is to be written in slope-intercept form. Without fully rearranging the equation, determine its gradient and y-intercept.

25. A line passing through (p, q) is given by $y - q = m(x - p)$. If this line also passes through $(2p, 0)$, express m in terms of p and q, and then write the equation in slope-intercept form.

26. A line passes through $(2, 5)$ and $(8, 17)$ and its equation is to be written in standard form with integer coefficients. Determine its equation.

27. A line is described by the property that when x increases by 3, y increases by 9. Given that the line passes through $(-1, 4)$, determine its equation in slope-intercept form.

28. If a line has gradient -5 and its y-intercept is equal to half the absolute value of its gradient, find the equation of the line.

29. Determine the equation of the line with gradient 4 that passes through the midpoint of the segment joining $(2, 3)$ and $(10, 7)$.

30. The line passing through $(a, a + 2)$ and $(2a, 3a - 4)$ has an equation of the form $y = mx + c$. First, express m and c in terms of a, and then find the specific equation when $a = 3$.