Foundation GCSE: Gradients

Name: _____ Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. Find the gradient of the line $y = 3x + 2$.
2. Find the gradient of the line $y = -4x + 7$.
3. A line goes 3 units across and 6 units up. What is its gradient?
4. Find the gradient of the line passing through $(0, 0)$ and $(2, 8)$.
5. Find the gradient of the line passing through $(1, 2)$ and $(4, 11)$.
6. Find the gradient of the line $2y = 6x + 8$.
7. Find the gradient of the line passing through $(-1, 3)$ and $(3, 11)$.
8. Determine the gradient of the line $5x + y = 10$.
9. Find the gradient of the line passing through $(2, 5)$ and $(6, 13)$.
10. A line has gradient 4 and passes through $(1, 7)$. Find its y-intercept c.
11. Find the gradient of the line passing through $(-2, -1)$ and $(3, 9)$.
12. Determine the gradient of the line $3x - 2y = 6$.
13. If the line passing through $(1, 2)$ and $(4, y)$ has a gradient of 3, find the value of y.
14. Find the gradient of the line parallel to $y = -3x + 4$.
15. Find the gradient of the line passing through $(-4, 2)$ and $(2, -4)$.
16. A line passes through $(0, c)$ and $(5, 15)$ with gradient 3. State c.
17. Find the gradient of the line $4x + 2y = 8$.
18. If the line through $(2, 3)$ and $(6, k)$ has a gradient of 2, find k.
19. Find the gradient of the line joining $(-3, -2)$ and $(3, 6)$.
20. Find the gradient of the straight line given by the equation $y - 5 = -2(x + 1)$.

Answers & Worked Solutions

1. 3 – Coefficient of x in $y = mx + c$.
2. -4 – Coefficient of x is -4.
3. 2 – $\dfrac{\text{rise}}{\text{run}} = \dfrac{6}{3} = 2$.
4. 4 – $\dfrac{8-0}{2-0} = 4$.
5. 3 – $\dfrac{11-2}{4-1} = \dfrac{9}{3} = 3$.
6. 3 – Divide equation by 2 to get $y = 3x + 4$.
7. 2 – $\dfrac{11-3}{3-(-1)} = \dfrac{8}{4} = 2$.
8. -5 – Rearrange to $y = -5x + 10$.
9. 2 – $\dfrac{13-5}{6-2} = \dfrac{8}{4} = 2$.
10. $3 - 7 = 4(1) + c \implies c = 3$.
11. 2 – $\dfrac{9-(-1)}{3-(-2)} = \dfrac{10}{5} = 2$.
12. $\dfrac{3}{2}$ or 1.5 – Rearrange to $2y = 3x - 6 \implies y = 1.5x - 3$.
13. 11 – $\dfrac{y-2}{4-1} = 3 \implies y - 2 = 9 \implies y = 11$.
14. -3 – Parallel lines have identical gradients.
15. -1 – $\dfrac{-4-2}{2-(-4)} = \dfrac{-6}{6} = -1$.
16. 0 – Since it passes through $(0, c)$, c is the y-intercept, which is 0 if $y = 3x$.
17. -2 – Rearrange to $2y = -4x + 8 \implies y = -2x + 4$.
18. 11 – $\dfrac{k-3}{6-2} = 2 \implies k - 3 = 8 \implies k = 11$.
19. $\dfrac{4}{3}$ – $\dfrac{6-(-2)}{3-(-3)} = \dfrac{8}{6} = \dfrac{4}{3}$.
20. -2 – Expand or recognize form $y = -2x - 2 + 5 = -2x + 3$, gradient is -2.