Single Pure – Parallel & Perpendicular Lines

Patrons are reminded that if two lines are parallel they have the *same* gradient. If two lines are perpendicular then find the gradient of the original line and then "change the sign and flip it over" to get the perpendicular gradient. Then use our old friend $y - y_1 = m(x - x_1)$.

Also, two gradients (m_1 and m_2) are perpendicular if $m_1 \times m_2 = -1$.

1. Find the equation of the line parallel to $2x + y = 5$ through the point $(1, 2)$ in the form $ax + by + c = 0$. $\boxed{2x + y - 4 = 0}$
2. Find the equation of the line perpendicular to $x - 3y - 8 = 0$ through the point $(5, 2)$ in the form $ax + by + c = 0$. $\boxed{3x + y - 17 = 0}$
3. Find the equation of the line parallel to $5x + y + 3 = 0$ through the point $(0, -\frac{1}{2})$ in the form $ax + by + c = 0$. $\boxed{10x + 2y + 1 = 0}$
4. Find the equation of the line perpendicular to $2x - y = 7$ through the point $(-1, 3)$ in the form $ax + by + c = 0$. $\boxed{x + 2y - 5 = 0}$
5. Find the equation of the line parallel to $2x + 3y = 0$ through the point $(0, 1)$ in the form $ax + by + c = 0$. $\boxed{2x + 3y - 3 = 0}$
6. Find the equation of the line perpendicular to $4x - 3y + 2 = 0$ through the point $(\frac{1}{2}, \frac{1}{3})$ in the form $ax + by + c = 0$. $\boxed{18x + 24y - 17 = 0}$
7. Find the equation of the line parallel to $x + y - 1 = 0$ through the point $(\frac{1}{4}, \frac{3}{5})$ in the form $ax + by + c = 0$. $\boxed{20x + 20y - 17 = 0}$
8. Find the equation of the line perpendicular to $\frac{1}{3}y - \frac{1}{2}x - \frac{7}{3} = 0$ through the point $(0, \frac{6}{7})$ in the form $ax + by + c = 0$. $\boxed{14x + 21y - 18 = 0}$
9. Find the equation of the line perpendicular to $3y - 2x + 1 = 0$ through the point $(\frac{1}{2}, \frac{3}{2})$ in the form $ax + by + c = 0$. $\boxed{6x + 4y - 9 = 0}$
10. Find the equation of the line parallel to $x - 5y + 1 = 0$ through the point $(\frac{5}{4}, 0)$ in the form $ax + by + c = 0$. $\boxed{4x - 20y - 5 = 0}$
11. Find the equation of the line perpendicular to $3x + 2y - 1 = 0$ through the point $(1, -1)$ in the form $ax + by + c = 0$. $\boxed{2x - 3y - 5 = 0}$
12. Find the equation of the line parallel to $2x + 3y - 7 = 0$ through the point $(2\frac{1}{3}, -1)$ in the form $ax + by + c = 0$. $\boxed{6x + 9y - 5 = 0}$
13. Find the equation of the line perpendicular to $2x + \frac{1}{2}y + 8 = 0$ through the point $(\frac{7}{3}, \frac{1}{3})$ in the form $ax + by + c = 0$. $\boxed{x - 4y - 1 = 0}$
14. Find the equation of the line parallel to $2x + y = 5$ through the point $(-1, \frac{3}{4})$ in the form $ax + by + c = 0$. $\boxed{8x + 4y + 5 = 0}$
15. Find the equation of the line perpendicular to $0 = 7x - 5y + 2$ through the point $(0, -3\frac{2}{3})$ in the form $ax + by + c = 0$. $\boxed{15x + 21y + 77 = 0}$
16. Find the equation of the line parallel to $y = px + 2$ through the point $(1, 0)$ in the form $ax + by + c = 0$. $\boxed{px - y - p = 0}$
17. Find the equation of the line perpendicular to $px + y = 5$ through the point $(\frac{1}{2}, 0)$ in the form $ax + by + c = 0$. $\boxed{2x - 2py - 1 = 0}$