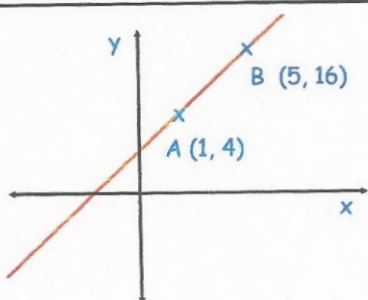


21st May



Find the equation of the line perpendicular to AB that passes through the midpoint of AB.

$MP = (3, 10)$ $\frac{16-4}{5-1} = \frac{12}{4} = 3$
 $y = -\frac{1}{3}x + c$ $y = -\frac{1}{3}x + 11$
 $10 = -\frac{1}{3}(3) + c$ $c = 11$

Samantha has 10 black socks, 8 white socks and 2 blue socks. She picks two socks at random, without replacement.

Calculate the probability she chooses two socks of the same colour.

$\frac{10}{20} \times \frac{9}{19}$ $\frac{90}{380}$ $\frac{148}{380}$
 $\frac{8}{20} \times \frac{7}{19}$ $\frac{56}{380}$
 $\frac{2}{20} \times \frac{1}{19}$ $\frac{2}{380}$

Prove algebraically that $(4n + 1)^2 - (2n - 1)$ is an even number for all positive integer values of n .

$= 16n^2 + 8n + 1 - (2n - 1)$
 $= 16n^2 + 6n + 2$
 $= 2(8n^2 + 3n + 1)$
 therefore even

The n^{th} term of a quadratic sequence is $n^2 + 4n$

Two consecutive terms have a difference of 25.

Work out the two terms. 140 and 165

$(n+1)^2 + 4(n+1) - (n^2 + 4n) = 25$
 $n^2 + 2n + 1 + 4n + 4 - (n^2 + 4n) = 25$
 $2n + 5 = 25$
 $2n = 20$
 $n = 10$

$\frac{81^y}{3^{y-5}} = 3\sqrt{3}$

Find y

$3\sqrt{3} = 3^{\frac{3}{2}}$
 $81^y = (3^4)^y$
 $= 3^{4y}$

$4y - (y - 5) = \frac{3}{2}$
 $3y + 5 = \frac{3}{2}$
 $3y = -\frac{7}{2}$
 $y = -\frac{7}{6}$