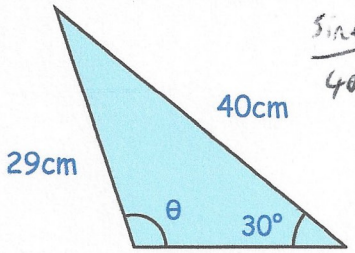
Name: _____ 5-a-day Higher Plus

30th August

Corbettmaths



$\frac{\sin\theta}{40} = \frac{\sin 30}{29}$

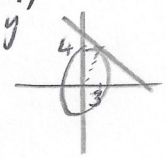
$\sin\theta = \frac{20}{29}$

Find the two possible values of θ

43.6° or 136.4°

Write down the equation of the tangent to the circle $x^2 + y^2 = 25$ at the point (3, 4)

x y



$\frac{4}{3}$

$-\frac{3}{4}$

$y = -\frac{3}{4}x + c$

$4 = -\frac{9}{4} + c$

$c = \frac{25}{4}$ $y = -\frac{3}{4}x + \frac{25}{4}$

There are 9 counters in a bag.

5 of the counters are red
4 of the counters are white.

Tom takes at random three counters from the bag.

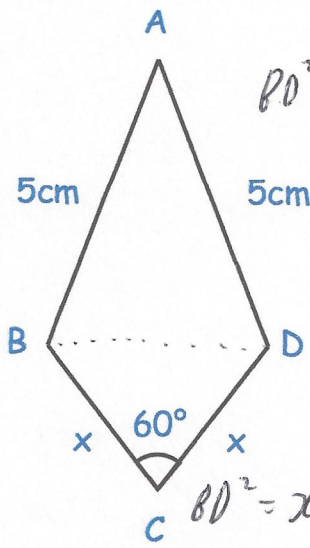
Work out the probability that the counters are all the same colour.

$P(RRR) = \frac{5}{9} \times \frac{4}{8} \times \frac{3}{7} = \frac{5}{42}$

$P(WWW) = \frac{4}{9} \times \frac{3}{8} \times \frac{2}{7} = \frac{1}{21}$

$P(\text{same}) = \frac{1}{6}$

Shown is kite ABCD



$BD^2 = 5^2 + 5^2 - 2 \times 5 \times 5 \times \cos BAD$

$= 50 - 50\cos BAD$

$BD^2 = x^2 + x^2 - 2 \times x \times x \times \cos 60$

$= 2x^2 - 2x^2(\frac{1}{2})$

$= 2x^2 - x^2$

$= x^2$

Prove

$$Cos BAD = 1 - \frac{x^2}{50}$$

$x^2 = 50 - 50\cos BAD$

$x^2 + 50\cos BAD = 50$

$50\cos BAD = 50 - x^2$

$\cos BAD = \frac{1 - x^2}{50}$