



16th January

Evaluate

$(125x^6)^{2/3}$

$125^{2/3} = 25$

$25x^4$

A bag contains 14 sweets.

8 sweets are red.  $P(RR) = \frac{8}{14} \times \frac{7}{13} = \frac{56}{182}$

4 sweets are yellow.  $P(YY) = \frac{4}{14} \times \frac{3}{13} = \frac{12}{182}$

2 sweets are green.

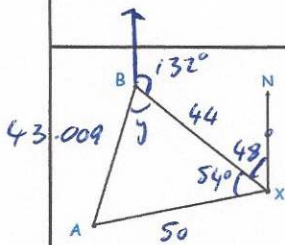
Two sweets are taken from the bag without replacement.  $P(GG) = \frac{2}{14} \times \frac{1}{13} = \frac{2}{182}$

Work out the probability that the two sweets are different colours.

$1 - P(\text{same})$

$P(\text{same}) = \frac{56}{182} + \frac{12}{182} + \frac{2}{182} = \frac{70}{182}$

$P(\text{different}) = 1 - \frac{70}{182} = \frac{112}{182} = \frac{8}{13}$



$AB^2 = 44^2 + 50^2 - 2 \times 44 \times 50 \times \cos 54$

$AB^2 = 1849.7...$

$AB = 43.009 \text{ km}$

Calculate the bearing of A from B.

$\frac{\sin 54}{43.009} = \frac{\sin y}{50}$

$\sin y = 0.9405...$

$y = 70.14^\circ$

$70.14 + 132 = 202.14^\circ$

Ship A is 50km from X on a bearing of  $258^\circ$ .  
Ship B is 44km from X on a bearing of  $312^\circ$ .

Shown is a right angle triangle.

Find the possible value(s) of x

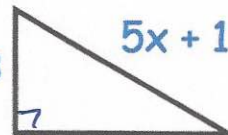
$(2x+3)^2 + (2x+4)^2 = (5x+1)^2$

$4x^2 + 12x + 9 + 4x^2 + 16x + 16 = 25x^2 + 10x + 1$

$8x^2 + 28x + 25 = 25x^2 + 10x + 1$

$0 = 17x^2 - 18x - 24$  (Quadratic formula)

$2x + 3$

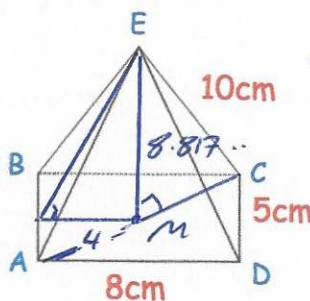


$2x + 4$

$x = 1.83$

or

$x = -0.771$



$AC^2 = 5^2 + 8^2$

$AC = 9.4339...$

$AM = MC = 4.7169...$

$EC^2 = MC^2 + ME^2$

$10^2 = 4.7169...^2 + ME^2$

$ME = 8.817...$

Shown below is a rectangular based pyramid. The apex E is directly over the centre of the base.

Calculate angle between the face ABE and the base ABCD



$\tan x = \frac{8.817}{4.7169}$

$\tan x = 1.871...$

$\tan^{-1}(\frac{1.871}{1}) = 65.6^\circ$

$65.6^\circ$