

10th April

Higher Plus 5-a-day



Corbettmaths

The pressure of a tyre is 32 pounds per square inch. *psi*

Given 1 pound = 0.4536 kilograms
1 inch = 2.54 centimetres

Work out the pressure in grams per square centimetre.

$$32 \text{ lbs/in}^2$$

$$\downarrow \times 0.4536$$

$$14.5152 \text{ kg/in}^2$$

$$\downarrow \times 1000$$

$$14515.2 \text{ g/in}^2$$

$$\downarrow \div 6.4516$$

$$2249.8605 \text{ g/cm}^2$$

$$2.54^2 = 6.4516$$

Given

$$(x+a)^2(x-2) = x^3 + bx^2 + 12x - 72$$

$$(x+a)(x+a)(x-2)$$

Find a and b

$$(x^2 + 2ax + a^2)(x-2)$$

$$x^3 - 2x^2 + 2ax^2 - 4ax + a^2x - 2a^2$$

(constants) $-2a^2 = -72$

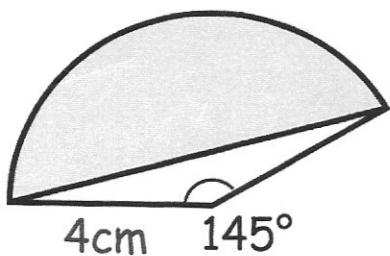
$$a^2 = 36$$

$$(a=6) \text{ or } a=-6$$

(x) $-4a + a^2 = 12$

$$a \neq -6$$

(x) $-2 + 2 \times 6 = 10$ $b=10$



Sector: $\frac{145}{360}$

triangle: $\frac{1}{2} \times 4 \times 4 \times \sin 145 = 4.5886 \text{ cm}^2$

$$20.2456 - 4.5886 = 15.657 \text{ cm}^2$$

Find the area of the segment

$$\times \pi \times 4^2 = 20.2456 \text{ cm}^2$$

Isla has a box of counters.

$$P(BB) = \frac{12}{41} \times \frac{12}{40} = \frac{36}{410}$$

$$P(RR) = \frac{28}{41} \times \frac{22}{40} = \frac{154}{410}$$

		Shape			
		Circle	Triangle	Square	
Colour	Blue	6	2	5	13
	Red	8	9	11	28
					41

Isla picks two counters at random.

Calculate the probability that the two counters are different colours.

$$1 - \left(\frac{36}{410} + \frac{154}{410} \right) = \frac{91}{205}$$

The first 4 terms of a sequence are:

800, 790, 775, 755, ...

-10 -15 -20

-5 -5

Which term is the first to be negative?

$$a = -2.5 \quad b = -2.5 \quad c = 805$$

$$-2.5n^2 - 2.5n + 805$$

$$18^{\text{th}} \text{ term } (-50)$$