

24th December



Corbettmaths

Expand and simplify

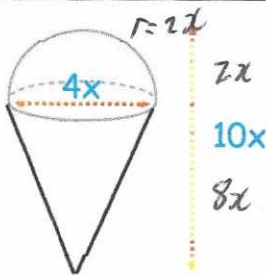
$(5x + 3)(x - 1)(x + 2)$

$$5x^3 + 8x^2 - 7x - 6$$

Simplify

$$\frac{4x^3 + 2x^2}{2x^2 - 9x - 5} = \frac{2x^2(2x + 1)}{(2x + 1)(x - 5)}$$

$$\frac{2x^2}{x - 5}$$



Hemisphere:

$$V = \frac{2}{3}\pi r^3$$

$$\frac{2}{3}\pi (2x)^3$$

$$\frac{2}{3} \times \pi \times 8x^3$$

$$= \frac{16}{3}\pi x^3$$

A solid is made by putting a hemisphere on top of a cone.

Find an expression for the volume in terms of x.

$$\text{Cone: } \frac{1}{3}\pi (2x)^2 \times 8x = \frac{32}{3}\pi x^3$$

Answer: $16\pi x^3$

Lifetime (months)	Frequency
$0 < t \leq 12$	19
$12 < t \leq 24$	53
$24 < t \leq 36$	74
$36 < t \leq 48$	42
$48 < t \leq 120$	12

84 is the midpoint

Calculate an estimate of the percentage of lightbulbs that last longer than 7 years.

84 months

$$\frac{6}{200} = 3\%$$

Find the equation of the tangent to the circle $x^2 + y^2 = 13$ at the point $(-2, 3)$

$(-2, 3)$

gradient of OA = $-\frac{3}{2}$

gradient of tangent = $\frac{2}{3}$

$$y = \frac{2}{3}x + c$$

$$3 = \frac{2}{3}(-2) + c$$

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

$$c = \frac{13}{3}$$

$$y = \frac{2}{3}x + \frac{13}{3}$$