Day 39	S Tier 10-a-day
1 Write $10^2 \times 25^2$ as a product of powers of prime numbers.	
2 The interior angles of a pentagon are $x°$, $(2x + 20)°$, $(2x - 25)°$, $(x + 30)°$, $(x - 10)°$ (a) Work out the value of x. (b) Work out the size of the largest angle.	
3 Simplify fully $\frac{3x^{\frac{1}{4}} \times 2x^{\frac{3}{4}}}{6x^{-\frac{1}{2}}}$	
4 In an animal shelter, the ratio of the number of cats to the number of dogs is 7 : 4. Then 7 more cats are added and 13 dogs are removed. The ratio is now 6 : 1. How many cats were there at the start?	
5 Expand and simplify $(2 - 3\sqrt{5})(2 + \sqrt{5})$ Give your answer in the form $p + q\sqrt{5}$	

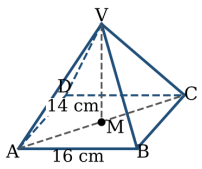
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6 P is directly proportional to v and inversely proportional to t.
When v = 6 and t = 3, P = 12.
Work out the value of P when v = 3 and t = 6.

7 Write $\frac{1+\sqrt{7}}{5-\sqrt{7}}$ in the form $p + q\sqrt{7}$
where p and q are rational numbers.

8 Solve $x^4 - 58x^2 + 441 = 0$

9 VABCD is a pyramid on a square base. V is directly above the centre M. (Calculator)
(a) Work out AC as a simplified surd.
(b) Work out the angle between VA and the base, to 1 d.p.
The diagram is not drawn accurately.



10 $f(x) = \frac{-3x+6}{3x+3}$ where $x \neq -1$
(a) Show that ff(x) = x.
(b) Write down $f^{-1}(x)$.