Day 96	S Tier 10-a-day
1 In triangle PQR, PQ = 4 cm and angle PQR = 30°. The area of the triangle is 11 cm^2. Work out the length of QR. Do not use a calculator.	
2 (a) Solve $-4 - 3x < 5$ (b) n is an integer. Write down all the values of n that satisfy $-2 < 3n + 1 \leq 13$	
3 The point P(4, −2) is reflected in the y-axis. The image is then rotated 90° clockwise about the origin. (a) Write down the coordinates of the final image of P. (b) Describe fully the single transformation that is equivalent to these two transformations.	
4 A machine is worth £8,000 when new. Its value decreases by 5% each year. After how many whole years will it first be worth less than £5,350? (Calculator)	
5 A is the point (−2, 1) and B is the point (2, −5). Find an equation of the perpendicular bisector of AB. Give your answer in the form ax + by = c, where a, b and c are integers.	

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6 Simplify fully $\frac{x^2 - 4x - 21}{x^2 + 7x + 12}$

7 Solve $3^{3x+3} = 27^{2x+3}$

8 The table gives information about 84 lengths.
Work out an estimate for the median.
Assume the values in each class are evenly spread.

Length, l (cm)	Frequency
$20 < l \leq 40$	9
$40 < l \leq 60$	18
$60 < l \leq 80$	4
$80 < l \leq 100$	4
$100 < l \leq 120$	25
$120 < l \leq 140$	24

9 A church bell rings every 5 minutes.
Another bell rings every 10 minutes.
A third bell rings every 14 minutes.
They all ring together at 7:00 am.
How many times do they all ring together between 7:00 am and 3:00 pm, including both 7:00 am and 3:00 pm if they do?

10 The table gives information about the masses of some eggs.
An estimate for the mean is 22.5.
Work out the value of x.

Mass, m (g)	Frequency
$10 < m \leq 15$	7
$15 < m \leq 20$	x
$20 < m \leq 25$	6
$25 < m \leq 30$	18
$30 < m \leq 35$	4