Day 276	S Tier 10-a-day
1 Solve $9x^2 - 6x - 8 = 0$	
2 Triangle ABC has AB = 5 cm and BC = 16 cm. The area of triangle ABC is $20\sqrt{2}$ cm^2. Angle ABC is obtuse. Work out the size of angle ABC. Do not use a calculator.	
3 A biased wheel stops on one of four outcomes with these probabilities. A: 3x; B: x + 0.2; C: 3x; D: 0.1 (a) Work out the value of x. (b) The biased wheel is used 60 times. Work out an estimate for the number of times it stops on A.	
4 A church bell rings every 6 minutes. Another bell rings every 8 minutes. A third bell rings every 15 minutes. They all ring together at 10:00 am. How many times do they all ring together between 10:00 am and 3:00 pm, including both 10:00 am and 3:00 pm if they do?	
5 Simplify $(4x^4y^{-4})^{\frac{3}{2}}$	

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6 The point P(−1, −5) is rotated 180° about the origin. The image is then reflected in the x-axis. (a) Write down the coordinates of the final image of P. (b) Describe fully the single transformation that is equivalent to these two transformations.	
7 A rectangle has length 10 cm and width 16 cm. Both measurements are correct to the nearest centimetre. Chen says that the area of the rectangle could be exactly 180 cm^2. Is Chen correct? You must show your working.	
8 A circle has equation $(x + 1)^2 + (y - 1)^2 = 130$. The point P(10, 4) lies on the circle. Find an equation of the tangent to the circle at P. Give your answer in the form ax + by = c, where a, b and c are integers.	
9 A sector of a circle has radius 24 cm and angle 180°. The sector is made into a cone by joining the two straight edges together. (a) Work out the radius of the base of the cone. (b) Work out the exact volume of the cone. Give your answer in terms of π, as a surd if necessary.	
10 Callum and Maya share some money in the ratio 5 : 7. Callum gives Maya £7. The ratio of their money is now 3 : 5. How much money do they have altogether?	