Day 349	S Tier 10-a-day

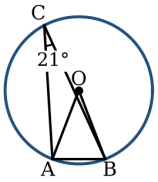
1 Simplify $\frac{2}{3+\sqrt{7}} + \frac{1}{3-\sqrt{7}}$

Give your answer with a rational denominator.

2 Simplify fully $\frac{3x^3y^5 \times 5x^6y^2}{3x^6y^3}$

Give your answer in the form kx^ay^b

3 A, B and C are points on a circle, centre O.
Angle ACB = 21°.
(a) Work out the size of angle AOB.
(b) Work out the size of angle OAB.
The diagram is not drawn accurately.

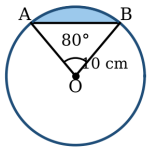


4 A and B are points on the curve $y = x^2 + x - 5$.
The x coordinate of A is 3 and the x coordinate of B is 5.
Work out the gradient of the line AB.

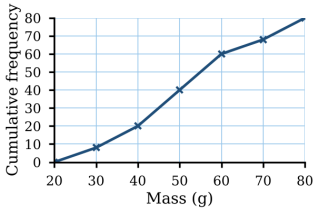
5 A church bell rings every 4 minutes.
Another bell rings every 15 minutes.
A third bell rings every 24 minutes.
They all ring together at 10:00 am.
How many times do they all ring together between 10:00 am and 3:00 pm, including both 10:00 am and 3:00 pm if they do?

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6 The circle has centre O and radius 10 cm. A and B are points on the circle and angle AOB = 80°. (Calculator)
Work out the area of the shaded segment. Give your answer correct to 3 significant figures.
The diagram is not drawn accurately.



7 The cumulative frequency graph gives information about the masses of 80 apples picked from a tree.
(a) Find an estimate for the median and the interquartile range.
(b) Estimate how many of the 80 had a mass greater than 75.



8 Solve the simultaneous equations
$x^2 + y^2 = 74$
$y = x + 2$

9 A walker leaves a camp P and travels 60 km on a bearing of 200° to Q. (Calculator)
It then travels 39 km on a bearing of 100° to R.
(a) Work out the distance PR.
(b) Work out the bearing of R from P.
Give distances to 1 decimal place and the bearing to the nearest degree.

10 The price of a coat is increased by 15%.
Later the new price is reduced by 30% in a sale.
The sale price is £338.10.
Work out the price before the increase.
(Calculator)