

Credit Mathematics – Homework G

Non-calculator section:

1. Evaluate $22.1 - 0.632 \times 30$
2. Express as a single fraction $\left(\frac{1}{2} + \frac{3}{4}\right) \div 1\frac{3}{7}$
3. $A = \frac{xy}{x-y}$. Find A when $x = -4$ and $y = -8$.
4. (a) Solve the equation $4x - 2(1 - 3x) = 8x$

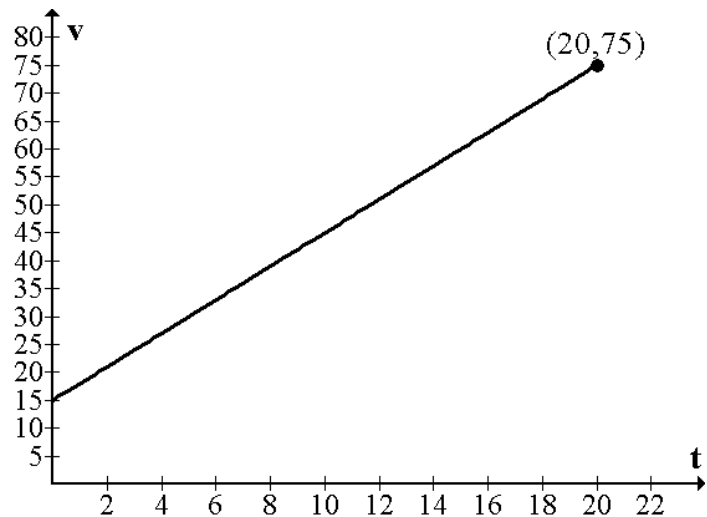
(b) Express as a single fraction $\frac{1}{x} + \frac{1}{x^3}$ $x \neq 0$

(c) Simplify $\frac{4p^2 - 9q^2}{4p + 6q}$

5. A tank of water contains 15 litres of water.

The graph opposite shows how the volume of water in the tank changes as a further 60 litres of water is added to the tank at a steady rate for 20 seconds.

Find the equation of the straight line in terms of v and t .



6. (a) Simplify $a^{\frac{1}{2}}(2a^{\frac{5}{2}} - a^{-\frac{1}{2}})$

(b) Express with a rational denominator $\frac{\sqrt{3}}{\sqrt{18}}$

Calculator section:

7. (a) The number of pupils in 7 third year classes in a secondary school are

23 26 25 25 22 28 26

Calculate the mean and standard deviation of the class sizes.

- (b) In the same school the mean and standard deviation of the number of pupils in 7 fourth year classes are 22 and 4.4 respectively.

Make two comparisons between the class sizes in third year and in fourth year.

8. The age of our universe is estimated to be 6.3×10^{17} seconds.
Calculate the estimated age of our universe in years.
Give your answer in Scientific Notation correct to 3 significant figures.



9. Solve the equation $5\sin x^\circ - 2\tan 50^\circ = 1$ $0^\circ \leq x^\circ \leq 360^\circ$

10. A concert venue has both seating and standing areas.

For a particular concert, tickets for the seating area cost £30 and for the standing area the tickets cost £25. Altogether the ticket sales total £28250.

- (a) Let x represent the number of tickets sold for the seating area and y the number of tickets sold for the standing area.

Write down an equation involving x and y .

Altogether 1050 people attend the concert.

- (b) Write down another equation involving x and y .

- (c) Find how many people bought tickets for the seating area.



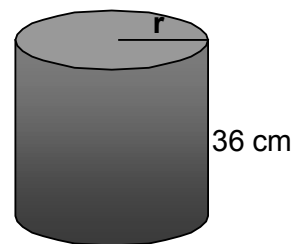
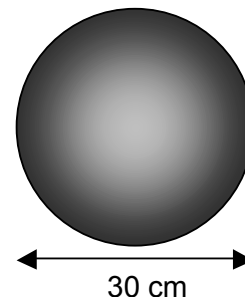
11. In the diagram opposite the sphere and the cylinder have the same volume

- (a) Calculate the volume of the sphere.

(Volume of sphere = $\frac{4}{3}\pi r^3$)

- (b) Given the height of the cylinder is 36 cm, calculate its radius.

(Volume of cylinder = $\pi r^2 h$)



12. Two identical industrial chimneys are 40 metres apart.
From a point A, the angle of elevation to the top of one chimney is 70° and from the same point the angle of elevation to the top of the other is 60° .

Calculate the height, h , of the chimneys.

