

### S5/6 National 5 Maths Homework 9

1. For each line, write down the gradient and the coordinates of the point where it crosses the y-axis.

a)  $y = 3x + 6$

b)  $y = 5 - 2x$

c)  $y + 3x = 4$

d)  $4y = 2x - 7$

e)  $x - y = 4$



2. Find the equation of the lines described below.

a) with gradient 5, passing through the point (0,9)

b) with gradient -8, passing through the point (0,7)

c) with gradient  $\frac{1}{2}$ , passing through the point (0,-4)

d) with gradient 2, passing through the point (1,6)

e) with gradient -4, passing through the point (5,2)



3. Expand the brackets and simplify  $(3a + 4)(2a - 5)$



4. Factorise fully  $2x^2 - 10x$



5. The speed of light in a vacuum is approximately  $2.998 \times 10^8$  metres per second. How far does light travel in one year?  
Give your answer in scientific notation.



- 6 a) Simplify  $\sqrt{3}(2\sqrt{3} + \sqrt{6})$

b) Express  $\frac{\sqrt{5}}{\sqrt{40}}$  with a rational denominator in its simplest form.

c) Simplify  $a^{\frac{3}{2}}(3a^{\frac{7}{2}} + a^{\frac{-3}{2}})$



7. Express  $\frac{2}{x^2} - \frac{1}{3x}$  as a single fraction in its simplest form.



8. Calculate the area of this sector.

