**REFRESHING YOUR BASIC KNOWLEGE**

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| ***1a If y = 12x2*** ***dy =*** ***dx*** | ***1b If dy = 12x2*** ***dx*** ***y =*** |
| ***2a If y = x5*** ***dy =*** ***dx*** | ***2b If dy = x5*** ***dx*** ***y =*** |
| ***3a If y = 3x4*** ***dy =*** ***dx*** | ***3b If dy = 3x4*** ***dx*** ***y =*** |
| ***4a If y = x3*** ***3*** ***dy =*** ***dx*** | ***4b If dy = x3*** ***dx 3*** ***y =*** |
| ***5a If y = (x + 7)(x – 9)*** ***dy =*** ***dx*** | ***5b If dy = (x + 7)(x – 9)*** ***dx***  ***y =*** |
| ***6a Find the gradient of y = x2 – 6x*** ***at x = 3***  | ***6b If dy = x2 – 6x*** ***dx*** ***find the equation for y given that the curve goes through (3, 10)*** |
| ***7a Find the gradient of y = x3 + x2*** ***3*** ***at the point (3, 18)*** | ***7b Find the equation of the tangent to the curve y = x3 + x2 at (3, 18)*** ***3***  |
| ***8a Find the gradient of the tangent***  ***to y = x2 – 4x at the point (1, -3)*** | ***8b Find the equation of the tangent***  ***to y = x2 – 4x at the point (1, -3)*** |

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| ***9 Find the x value of the point on the curve y = x2 – 6x + 8 where the***  ***gradient is equal to 4*** |
| ***10 Find the x value of the point on the curve y = x2 – 6x + 8 where the***  ***gradient is equal to 0.*** ***Also do a sketch to verify whether this is a maximum point or a***  ***minimum point.*** |
| ***11 Find the x values of the points on the curve y = 2x3 – 6x2 – 12***  ***where the gradient is equal to 0.*** ***Also do a sketch to verify which value gives a maximum point and***  ***which value of x gives a minimum point.*** ***Between what two x values is this function decreasing?*** |
| ***12 The height of a ball kicked vertically up is h = 40t – 5t2.***  ***Find the greatest height the ball will reach.***  |