 Tangent to a curve and derivative of a function

| Content | Teaching strategies and activities | Resources |
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| The concept of a gradient function. | Introduction of continuous functions<http://www.mathsisfun.com/calculus/continuity.html>Limits and Continuity<https://www.youtube.com/watch?v=YmuqoXnCSNI>Finding Limits <http://www.freemathhelp.com/find-limit.html>Curve and Derivative Interactive<http://www.oercommons.org/courses/calculus-grapher/view> Desmos Gradient Function <https://www.desmos.com/calculator/1uixceqq5a>Geogebra Tube Demonstration<http://tube.geogebra.org/material/simple/id/46467> | Introduction to the Gradient Functions<https://www.youtube.com/watch?v=8gMLbb9ALMI>Stationary Points <https://www.youtube.com/watch?v=g5_xlL8Ofh8>Sketching the Gradient Function<https://www.youtube.com/watch?v=MAAPOAoS3Sw> |
| Differentiation from first principles. | First Principles <https://www.youtube.com/watch?v=Ayf9gKwjXlY> | Set of activities for self-discovery of differentiation by first principlesLinear<http://www.scootle.edu.au/ec/viewing/L7819/index.html>Non-linear<http://www.scootle.edu.au/ec/viewing/L7820/index.html>The derivative<http://www.scootle.edu.au/ec/viewing/L7821/index.html>Cubic<http://www.scootle.edu.au/ec/viewing/L7823/index.html>Quartic<http://www.scootle.edu.au/ec/viewing/L7824/index.html>Powers<http://www.scootle.edu.au/ec/viewing/L7822/index.html> |
| The power rule. | Differentiation Worksheet (Mathslinks)<http://mathslinks.net/faculty/2u-differentiation-notes> Foldable (Mathlinks)<http://mathslinks.net/faculty/2u-differentiation-notes>  | Differentiation Short Method<https://www.youtube.com/watch?v=Px4Ow-1hIlY> |
| The chain rule. |  | <https://www.youtube.com/watch?v=DhUCSxZbtCM> |
| The product rule. |  | Why we need the Product rule<https://www.youtube.com/watch?v=nR2pnZc3p7I>Product Rule example one<https://www.youtube.com/watch?v=O2LC5uoZzXg>Product rule example two<https://www.youtube.com/watch?v=Gj7iBE-ltnE> |
| The quotient rule. |  | The Quotient rule<https://www.youtube.com/watch?v=9Vuhd9QMNic&app=desktop>The quotient rule example two<https://www.youtube.com/watch?v=O6M4O7zY5eA&app=desktop> |
| Equations of tangents and normals to the curve at a given point. |  | Tangents and Normals <https://www.youtube.com/watch?v=9pWiu7VxXP4> |
| Resources for Differentiation |  | Maths Scandal (the history of calculus<https://www.youtube.com/watch?v=axZTv5YJssA>Differentiation Calculator<http://www.derivative-calculator.net/>The differentiation song (I will derive)<https://www.youtube.com/watch?v=P9dpTTpjymE>Uses of Differentiation<http://www.s-cool.co.uk/a-level/maths/differentiation/revise-it/uses-of-differentiation>Basic Derivative Rules<https://www.youtube.com/watch?v=54KiyZy145Y>Derivatives Cheat Sheet<http://tutorial.math.lamar.edu/pdf/Calculus_Cheat_Sheet_Derivatives.pdf>Differentiation Notes<http://mathslinks.net/faculty/2u-differentiation-notes> |
|  |  | Calculus applets<http://webspace.ship.edu/msrenault/GeoGebraCalculus/GeoGebraCalculusApplets.html>  |
| Other Resources |  | What is calculus used for (Ted)<https://www.youtube.com/watch?v=_Idra8rVS1I> Intro (Basic Ideas of Calculus)<https://www.youtube.com/watch?v=6sNeE-mMYB8>  |