Pearson Edexcel

Teaching and Learning

Activity 1 responses/comments

A Let $P(x) = \frac{Q(x)}{x-a} + R$ where $Q(x)$ is a polynomial and R is real.

Then $P(x) = Q(x) + R(x-a)$

This is an identity so putting $x = a$ gives $P(a) = R$ (as $Q(a)$ is finite)

B $f'(x) = \frac{1}{x+\sqrt{1+x^2}} \times \left(1 + \frac{x}{\sqrt{1+x^2}}\right) = \frac{1}{x+\sqrt{1+x^2}} \times \frac{(\sqrt{1+x^2}+x)}{\sqrt{1+x^2}} = \frac{1}{\sqrt{1+x^2}}$

C $y = \frac{1}{8}x^3 - 24x^{\frac{-1}{2}} + 1$ $\quad y' = \frac{3}{8}x^2 + 12x^{\frac{-3}{2}}$

D $(4 - 2\sqrt{2})x = 20\sqrt{2}$ $\quad x = \frac{20\sqrt{2}}{4-2\sqrt{2}} = \frac{20\sqrt{2}}{4-2\sqrt{2}} \times \frac{4+2\sqrt{2}}{4+2\sqrt{2}} = \frac{80\sqrt{2}+80}{8} = 10\sqrt{2} + 10$

E $(x-4)^2 + (y+5)^2 - 16 - 25 = 0$ So centre at (4, -5) and radius $\sqrt{41}$

F Let $P(x) = (x-a)^2 Q(x)$ where $Q(x)$ is a polynomial

Then $P'(x) = 2(x-a)Q(x) + (x-a)^2 Q'(x)$

This is an identity so putting $x = a$ gives $P(a) = 0$ (as $Q(a)$ is finite) and $P'(a) = 0$ as ($Q(a)$ and $Q'(a)$ are finite.)

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Demand diagrams Answers

Least demand to greatest demand

Letter	Comment
E	Straightforward application of $a^2 + b^2 = c^2$
B	Harder application of $a^2 + b^2 = c^2$, but diagram in a 'nice' orientation
F	The diagram helps them to see it's Pythagoras
A	Harder application of $a^2 + b^2 = c^2$ and diagram in not in a 'nice' orientation
D	They have to draw the shape, see it's a right-angled triangle and use Pythagoras correctly
C	No diagram, no clue it's Pythagoras
G	Multistep
H	Above grade 9?