IB SL MATHEMATICS

DIFFERENTIATION REVIEW WORKSHEET

NAME: _____ **DATE:** _____

Complete the following showing all work.

1) $y = (x^3 + 3)^5$

2) $y = (-3x^5 + 1)^3$

3) $y = (-5x^3 - 3)^3$

4) $y = (5x^2 + 3)^4$

5) $f(x) = (5x^5 + 5)(-2x^5 - 3)$

6) $f(x) = (-3 + x^{-3})(-4x^3 + 3)$

7) $y = (-2x^4 + 5x^2 + 4)(-3x^2 + 2)$
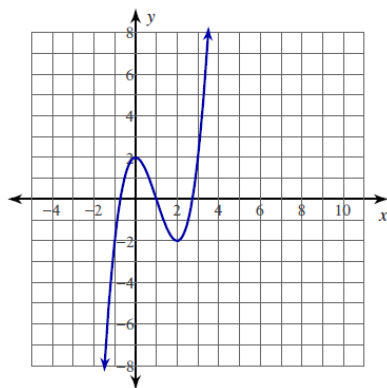
8) $y = \dfrac{3x^4 + 5x^3 - 5}{2x^4 - 4}$

9) $y = \dfrac{x^3 - x^2 - 3}{x^5 + 3}$
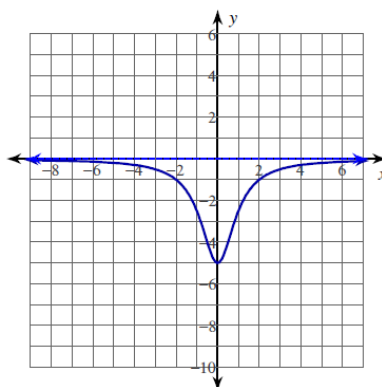
10) $y = \dfrac{x^4 + 6}{3 - 4x^{-4}}$

SECTION 2:

For each problem, find the equation of the line tangent to the function at the given point. Your answer should be in slope-intercept form.

1) $y = x^3 - 3x^2 + 2$ at $(3, 2)$

2) $y = -\dfrac{5}{x^2 + 1}$ at $\left(-1, -\dfrac{5}{2}\right)$

3) $y = x^3 - 2x^2 + 2$ at $(2, 2)$

4) $y = -\dfrac{3}{x^2 - 25}$ at $\left(-4, \dfrac{1}{3}\right)$

5) $y = -\dfrac{3}{x^2 - 4}$ at $(1, 1)$

6) $y = (5x + 5)^{\frac{1}{2}}$ at $(4, 5)$

7. A curve whose equation is $y = \frac{a}{x} + c,$ passes through a the point (3, 9) with gradient of 5. Find the values of the constant a and c.

8. A curve whose equation is $y = a\sqrt{x} + b$ passes through a the point (4, 6) with gradient of 3. Find the values of the constant a and b.

9. A curve whose equation is $y = A\sqrt{x} + \frac{B}{\sqrt{x}}$ passes through a the point (1, 6) with gradient of -1. Find the values of the constant A and B.

THE END