MATCH MATHS

Mathematics Advanced

Sample Mini Mock - Worked Solutions

20 marks | Suggested time: 30 minutes

Fixed public sample - no sign-in or paper allowance required

Section I answers

Question 1: B

f(4) = 2(4) - 3 = 5.

Question 2: B

From the exact-value triangle, sin 30 degrees = 1/2.

Question 3: A

Using the power rule, dy/dx = $3x^2$ - 4.

Question 4: B

Var(X) = p(1 - p) = 0.4(0.6) = 0.24.

Question 5: C

a_{10} = 7 + 9(3) = 34.

Section II worked solutions

Question 6

Step 1: Differentiate: dy/dx = 2x + 2.

Step 2: At x = 1, the gradient is 4 and the point is (1, 3).

Step 3: y - 3 = 4(x - 1), so **y = 4x - 1**.

Question 7

Area = (1/2)r^2 theta = (1/2)(36)(2 pi / 3) = **12 pi cm^2**.

Arc length = r theta = 6(2 pi / 3) = 4 pi cm.

Perimeter = 12 + 4 pi, so **P = (12 + 4 pi) cm**.

Question 8

Total probability is 1: k + 2k + k = 1, so **k = 1/4**.

E(X) = 0(k) + 1(2k) + 2(k) = 4k = **1**.

Question 9

$A = P(1 + r)^n = 5000(1.04)^3$.

$A = 5624.32$, so the investment is worth **$5624.32**.

Question 10

An antiderivative of $3x^2 + 2x$ is $x^3 + x^2$.

$[x^3 + x^2]_0^2 = (8 + 4) - 0 = \mathbf{12}$.