

Questions taken from the WJEC SAMS Applied Paper

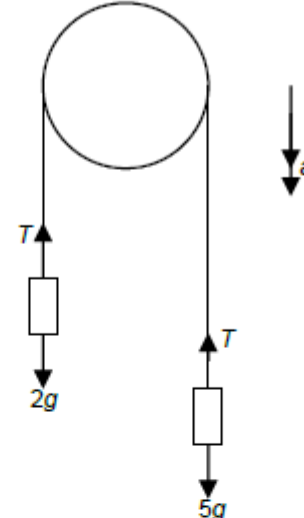
1(a)	$P(A \cup B) = P(A) + P(B)$ $= 0.2 + 0.3 = 0.5$	M1 A1
(b)	$P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $= P(A) + P(B) - P(A)P(B)$ $= 0.2 + 0.3 - 0.06 = 0.44$	M1 A1 A1
2(a)	$H_0: p = 0.45 : H_1: p < 0.45$	B1
(b)(i)	Under H_0 , X is $B(60, 0.45)$. Sig level = $P(X \leq 20)$ $= 0.0446$	B1 M1 A1
6. (a)	$v^2 = u^2 + 2as, u=0, a=9.8, s=160$ $v^2 = 2 \times 9.8 \times 160$ $v = 56 \text{ (ms}^{-1}\text{)}$	M1 A1 A1
(b)	$s = ut + 0.5at^2, u=0, a=9.8, s=160$ $160 = 0.5 \times 9.8 \times t^2$ $t = \frac{40}{7} \text{ (s)}$	M1 A1 A1
(c)	Object modelled as particle. Air resistance/external forces apart from gravity all ignored.	B1
		[7]

<p>10.</p>	<p>Resultant force vector = $\mathbf{F} + \mathbf{G}$ $= (\mathbf{i} - 8\mathbf{j}) + (3\mathbf{i} + 11\mathbf{j})$ $= 4\mathbf{i} + 3\mathbf{j}$</p> <p>Magnitude of force = $\sqrt{4^2 + 3^2}$ $= 5 \text{ (N)}$</p> <p>Use $F = ma$</p> <p>mag. of acceleration = $\frac{5}{3} \text{ (ms}^{-2}\text{)}$</p> <p>Let θ be angle direction of motion makes with the vector \mathbf{i}.</p> <p>$\tan \theta = \frac{3}{4}$</p> <p>$\theta = 36.87^\circ$</p>	<p>B1</p> <p>M1 A1</p> <p>M1 A1</p> <p>M1</p> <p>A1</p>
	<p><u>Alternative solution</u></p> <p>Resultant force vector = $\mathbf{F} + \mathbf{G}$</p> <p>$= (\mathbf{i} - 8\mathbf{j}) + (3\mathbf{i} + 11\mathbf{j})$ $= 4\mathbf{i} + 3\mathbf{j}$</p> <p>Use $\mathbf{F} = m\mathbf{a}$ $4\mathbf{i} + 3\mathbf{j} = 3\mathbf{a}$ $\mathbf{a} = \frac{4}{3}\mathbf{i} + \mathbf{j}$</p> <p>mag $\mathbf{a} = \sqrt{\left(\frac{4}{3}\right)^2 + 1}$</p> <p>mag $\mathbf{a} = \frac{5}{3} \text{ (ms}^{-2}\text{)}$</p> <p>Direction = $\tan^{-1}\left(\frac{3}{4}\right)$ $= 36.87^\circ$</p>	<p>(B1)</p> <p>(M1)</p> <p>(A1)</p> <p>(M1)</p> <p>(A1)</p> <p>(M1)</p> <p>(A1)</p> <p>[7]</p>

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(b)	Close the gaps between the bars as length of single is a continuous variable	B1
	Correct the width of column 3.0–4.0	B1

The one you might have needed your flipped learning notes for:

7. (a)	 <p>Apply N2L to one particle $5g - T = 5a$</p> <p>Apply N2L to other particle $T - 2g = 2a$ $3g = 7a$ $a = 4.2 \text{ (ms}^{-1}\text{)}$ $T = 28 \text{ (N)}$</p>	M1 A1 A1 m1 A1 A1
(b)	Light string enables me to assume tension is constant throughout the string.	E1 [7]