Math SL PROBLEM SET 38

Section A (Skills/Concepts Consolidation)

1. (**SP5.6 - R**) (**CI**) Two events A and B are such that p(A) = 0.6 and p(B) = 0.3 and p($A \cap B$) = 0.3. **(Cirrito 15.2, p509)**

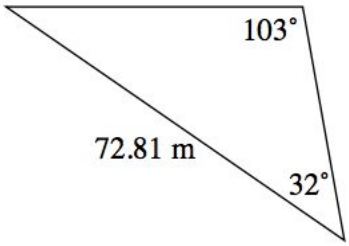
   a. Are the events dependent or independent?
   b. Find the probability of the following events:

      i. $A \cup B$ ii. $A \mid B$ iii. $B \mid A$ iv. $A \mid B'$

2. (**V4.3 - N**) (**CI**) Find the vector equation of the line passing through the points A and B. Express your equations in vector form, parametric form and Cartesian form. **(Cirrito 12.7.1, p447)**

   a. (i) $A(2,3)$ and $B(4,8)$ (ii) $A(4,-3)$ and $B(-1,-2)$
   b. (i) $A(2,3,5)$ and $B(-1,4,8)$ (ii) $A(-2,4,-3)$ and $B(-1,0,-2)$

3. (**T3.6 - R**) (**CA**) The diagram shows a triangular building lot. The distance are given in meters. Find the perimeter and area of this lot, giving your answers correct to the nearest hundredth. **(Cirrito 9.5.1, p290)**



4. (**V4.3 - N**) (**CA**) Find the angle between the $\mathbf{V}_1$, which is defined in the Cartesian form of $\frac{2x-5}{4} = \frac{y+3}{-2}$ and $\mathbf{V}_2$, which is defined in parametric form as $x(t) = -2 + 3t$ and $y(t) = 4 + t$. (HINT: Change equations to function form …..) **(Cirrito 12.7.1, p444)**

5. (**F2.5, C6.1 - R,E**) (**CI & CA**) Given $g(x) = \frac{x+7}{2x-5}$, determine: **(Cirrito 5.3.5, p144)**

   a. The value(s) of the x- and y-intercepts.
   b. The equation(s) of the asymptote(s).
   c. Sketch the function.
   d. (**CA**) Determine the value of the following limits:

      i. $\lim_{x \to \infty} g(x)$ ii. $\lim_{x \to -\infty} g(x)$ iii. $\lim_{x \to 2.5} g(x)$ iv. $\lim_{x \to 2} g(x)$

   e. Determine the equation of $y = g^{-1}(x)$

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Section B (Skills/Concepts Practice)

6. **(T3.3 - E) (CI)** Trig Identities. Working with the Pythagorean Identity:

   a. Rewrite $\cos(x)$ and $\tan(x)$ in terms of $\sin(x)$ only.
   b. If $\cos(x) = -\frac{2}{3}$, use the Pythagorean Identity to find the values of $\sin(x)$ and of $\tan(x)$.
   c. Simplify the expression $(1 - \cos^2 x)(\csc x)$ to a single trigonometric function (where $\csc x$ is the reciprocal function of the sine function.)
   d. Simplify $\cos^2 x - \cos^2 x \tan^2 x$.

7. **(T3.5 - R) (CI)** Quadratic Trig Equations. Each of these equations has already been factored for you. Solve for x on the domain of $-2\pi \leq x \leq 2\pi$.

   a. $\cos x\,(\sqrt{2}\sin x + 1) = 0$ b. $(\cos x - 1)(2\cos x + 1) = 0$

8. **(T3.5 - E) (CI)** Quadratic Trig Equations: Factor, then solve the following expressions for x on the domain of $0 \leq x \leq 2\pi$:

   a. $1 - \cos^2 x = 0$ b. $1 - 4\sin^2 x = 0$ c. $\sin x - \sin^2 x = 0$

9. **(T3.5 - E) (CI)** Equations & Identities. Each of these equations involves a double angle. Solve for x on the domain of $0 \leq x \leq 2\pi$:

   a. $\sin(2x) - \sin(x) = 0$ b. $\cos(x) - \cos(2x) = 0$

Section C (Skills/Concepts HW)

10. Oxford, Ex 12J, p432, Q3,4

11. Oxford, Ex 12H, p424, Q2,3