Math SL PROBLEM SET 35

Section A (Skills/Concepts Consolidation)

1. (**T3.5 - N**) (**CI**) Given the domain of $0° \leq x \leq 360°$, solve the following equations:
   (Cirrito 10.4, p351 ….look for tan fcns examples)
   a. Solve $\sqrt{3}\tan(x) + 1 = 0$
   b. Solve $\tan^2(x) - \tan(x) = 0$

2. (**V4.1 - N**) (**CI**) Let $\mathbf{u} = \mathbf{i} + 3\mathbf{j} - 2\mathbf{k}$ and let $\mathbf{v} = 2\mathbf{i} + \mathbf{j}$. Find   **(Cirrito 12.5.1, p429)**

   a. $|\mathbf{u} + \mathbf{v}|$
   b. $|\mathbf{u}| + |\mathbf{v}|$
   c. $|-3\mathbf{u}| + |3\mathbf{v}|$
   d. $\frac{1}{|u|}\mathbf{u}$

3. (**V4.3 - N**) (**CI**) Points (x, y) described by the equations $x = 1 + 2t$ and $y = 3 + t$ form a line. Is the point $(7, 6)$ on this line? How about $(-3, 1)$? How about $(6, 5.5)$? How about $(11, 7)$?
   (Cirrito 12.7.1 p444)

4. (**V4.3 - N**) (**CA**) Now use your calculator to graph the function $(x, y) = (1,3) + t(2,1)$ using parametric mode. You will enter the equation as $x(t) = 1 + 2t$ and $y(t) = 3 + t$. What is the role or significance of the parameter t ?   **(Cirrito 12.7.1 p444)**

5. (**F2.6 - R, E**) (**CI**) Given the function $g(x) = \log_2(x + 1)$, determine the following:
   (Cirrito 5.4.2, p164)

   a. The domain and range of g.
   b. The intercept(s) of g.
   c. The equation of g^{-1}.
   d. The simplified equation of $f \circ g(x)$ if $f(x) = 2^x - 1$.
   e. Given your answer to (d), what conclusion can you make about $f(x)$?

Section B (Skills/Concepts Practice)

6. **(T3.3 - E) (CI)** SKILL: Trig Identities. Given that the sine ratio of an angle is ⅗ (i.e. $\sin(x) = ⅗$) and that $\frac{\pi}{2} \leq x \leq \pi$:

   a. Draw a right triangle and label all known information about the angle.
   b. Determine the cosine and tangent ratios of the angle as well as the values of $\cos^2(x)$ and $\tan^2(x)$.
   c. Use the information in the triangle to evaluate $\tan^2(x) + 1$.

7. **(T3.3 - E) (CI)** SKILL: Trig Identities. Given that $\cos(x) = \frac{4}{5}$ and that $\frac{3\pi}{2} \leq x \leq 2\pi$, find the exact values of:

   a. $\cos(x)$ b. $\cos(2x)$ c. $\sin(2x)$ d. $\tan(2x)$ e. $\sin\left(\frac{x}{2}\right)$

8. **(T3.3 - E) (CI)** SKILL: Trig Identities. Given that $\tan(x) = -3$ and that $\frac{\pi}{2} \leq x \leq \pi$, find the exact values of:

   a. $\sin(2x)$ b. $\cos(2x)$ c. $\sin(4x)$ d. $\tan(2x)$ e. $\tan(4x)$

9. **(T3.5 - R) (CI)** SKILL: Linear Trigonometric Equations. Solve the following equations on the domain of $0 \leq x \leq 3\pi$:

   a. $2\sin\left(x + \frac{\pi}{3}\right) + 1 = 0$ b. $2\cos(2x) - 1 = 0$ c. $\tan(2x) - \sqrt{3} = 0$

Section C (Skills/Concepts HW)

10. **(T3.3 - E) (CI)** Trig Identities. Cirrito, Ex 10.4, p359, Q1cf, 2ce, 3ad

11. **(T3.5 - R) (CI)** Linear Trig Equations: Cirrito, Ex 10.4, p359, Q5bcfg