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| **Chapter 6 Review** Section 6.1  **1.** Determine the restrictions  **a)**  **b)** **c)**  **d)**  **2.** Determine the restrictions for  **3.** Simplify each expression  **a)**  **b)** cot *x* sin *x* **c)**  **d)**  **4.** Simplify each expression.  **a)** 2(csc2 *x*  cot2 *x*) **b)** cot2 *x* (sec2 *x*  1)  **c)**  **d)**  **e)** tan *x* cos2 *x* **f )**  **5.** Are the following identities? **a)** sin2 *x* sec2 *x*  sec2 *x*  1  **b)**  **c)** cot *x*  tan *x*  csc *x* cot *x*  **6.** Simplify each expression **a)**  **b)** cos *x*  tan *x* sin *x* **c)** sin *x*  cos *x* cot *x*  **7.** Verify sin4 *x*  cos4 *x*  2 sin2 *x*  1 for .  **8.** Verify sec *x*  sec *x* cos *x*  1  sec *x*. for .  **9.** Given . **a)** Verify for  **b)** What are the restrictions of the equation in 0°≤*x*360°.  **10.** Algebraically change cos2 *x*  sin2 *x*  1into cot2 *x*  1  csc2 *x*  **Section 6.2 Extra Practice**  **1.** Write each expression as a single trigonometric function.  **a)** sin 28° cos 35°  cos 28° sin 35°  **b)** cos 10° cos 7°  sin 10° sin 7°  **c)**  **d)**  **2.** Simplify and then give an exact value for each expression.  **a)** cos 25° cos 5°  sin 25° sin 5°  **b)** sin 40° cos 20°  cos 40° sin 20°  **c)**  **3.** Prove each identity for all permissible values of *x*.  **a)** csc2 *x*(1 − cos2 *x*) = 1 **b)** (tan *x* − 1)2 = sec2 *x* − 2 tan *x*  **c)**  **4.** Prove each identity. **a)**  **b)**  **c)**  **5.** Prove each identity. **a)**  **b)**  **c)**  **6.** Prove each identity. **a)**  **b)**  **c**  **7.** Prove the following **a)** cos (*x* + *y*) cos (*x* − *y*) = cos2 *x* − sin2 *y*  **b)**  **c)** 1 + sin 2*x* = (sin *x* + cos *x*)2  **d)** sec2 *x* =  **8.** Prove each identity **a)** sec4 *x* − sec2 *x* = tan4 *x* + tan2 *x*  **b)** cos *x* + cos *x* tan2 *x* = sec *x*  **9.** Consider the equation .  Show that the equation is true for *x* = 3.2 radians.  **10. a)** Prove . **b)** State all restrictions.  **11.** Prove the following identity. 1 + sin 2*x* = (sin *x* + cos *x*)2  **12.** Prove the identity. cos 3*x* + 1 = 4cos3 *x* − 3cos *x* + 1  **Section 6.4 Extra Practice**  **1.** Solve each equation algebraically over the domain 0 ≤ *x*<2π.  **a)** sin 2*x* − cos *x* = 0 **b)** cos 2*x* = 0  **c)** 2cos2*x* − 1 = 0 **d)** cos2 *x* − 2 = cos *x*  **2.** Solve each equation over the domain 0°≤*x*<360°.  **a)** cos 2*x* = cos 3*x* **b)** 2 cos2 *x* − 5 sin *x* − 5 = 0  **c)** cot2 *x* = 0  **3.** Rewrite each equation in terms of cosine only. Then, solve algebraically for  **a)** cos 2*x* − 5 cos *x* = 2 **b)** cot2 *x* + 2 = 0 **c)** 1 + cos *x* = 2 sin2 *x*  **4.** Solve 2 cos2 *x* = 1 over the domain −180° ≤ *x* ≤ 180°.  **5.** Solve tan2 *x* + 2 tan *x* + 1 = 0over the domain 0 ≤ *x* < 2π.  **9b)** *x*  0°, 180° **10.**  **Section 6.2**  **1. a)** sin 63° **b)** cos 17° **c)**  **d)**  **2. a)**  **b)**  **c)** 1 **d)**  **3. a)**  **b)**  **c)** cos 30°  3 **d)**  **4. a)** cos A **b)** sin A **c)** sin A **d)** cos A  **5. a)** cos A **b)** cos A **c)** cos A **d)** sin A  **6. a)** cos  **b)** cos (4*x*) **c)** sin  **d)** sin   **7. a)**  **b)**  **c)**  **d)**  **8. a)** true **b)** false **c)** true **d)** false  **9. a)**  **b)**  **c)**  **d)**  **10.**  **6.3 Extra Practice**  **1.** **a)**  **b)**  **c)** cos *x* **2.** **a)** tan *x* **b)**  **c)**  **d)** sin *x* – 1 **3a)**      **3b)**  **3c)** Example: **4. a)** Example: right side = tan *x*      **b)** Example:      **c)**    **7.** **a)** Example:    **b)** Example:    **c)** Example:    **d)**      **8.** **a)**  Example: | **d)**  **3.** Write each expression as a single trigonometric function.  **a)**  **b)**  **c)**  **d)**  **4.** Simplify each expression using a sum identity.  **a)** sin (90°  A) **b)** cos (90°  A)  **c)** sin (π  A) **d)** cos (2π  A)  **5.** Simplify each expression using a difference identity.  **a)** sin (90°  A) **b)** sin (270°  A)  **c)** sin  **d)**  cos  **6.** Simplify each expression  **a)**  **b)** cos 3*x* cos *x*  sin 3*x* sin *x*  **c)**  **d)**  **7.** Determine the exact value of each expression.  **a)**  **b)** tan 15° **c)** sin 105° **d)**  **8.** Determine whether each equation is true.  **a)** cos 80°  cos 75° cos 5°  sin 75° sin 5°  **b)** cos (24°)  cos 16°  cos 40° **c)** tan 70°   **9.** If A &B are both in quadrant I, & sin A   & cos B  evaluate each of the following.  **a)** cos (A  B) **b)** sin (A  B) **c)** cos 2A **d)** sin 2A  **10.** If cos A  , and A is in quadrant IV, find the exact value of sin 2A.  **Section 6.3 Extra Practice**  **1.** Simplify each expression  **a)**  **b)**  **c)**  **2.** Factor and simplify each rational trigonometric expression.  **a)**  **b)**  **c)**  **d)**  **6.** Determine and correct the mistake in the following work.  sin 2*x* = 1  sin *x* =  *x* = 60° and 120°  **7.** A student writes the general solution for sin 2*x* = 1 over the domain 0 ≤ *x* < 2π as  *n* ∈ I.  **a)** What error did the student make?  **b)** Write the correct general solution for this equation.  **8.** Solve cos *x* − 2 sin *x* cos *x* = 0 over the domain 0 ≤*x*< 2π.    **9.** Solve (sin *x* − 1)(tan *x* − 1) = 0 for all values of *x*.  **10.** Solve 2 cos 2*x* + 1 = 0Give the general solution in degrees.  **Chapter 6 Answers Section 6.1**  **1. a)**  *n* ∈ I **b)** *x* ≠ π*n*; *n* ∈ I and  *n* ∈ I  **c)** *n* ∈ I and  *n* ∈ I **d)**  *n* ∈ I  **2.** *n* ∈ I **3. a)** cos *x* **b)** cos *x* **c)** sin *x* **d)** tan *x*  **4. a)** 2 **b)** 1 **c)** sec2 *x* **d)** 1 **e)** sin *x* cos *x* **f )** 1 **5. a)** Yes **b)** No **c)** No  **6. a)** cot *x* **b)** sec *x* **c)** csc *x*  **7.**      **8.**  **9.** **a)**    **c)** Example:      **5a)** Example:        **5b)**  **c)**    **6.** **a)**    **b)**    **b)**      **9**Verify for *x*  3.2:    .  **10. a)**  **11.** Example:    **b)**  *n* ∈ I  **12.** Example:      **Section 6.4**  **1. a)**  **b)**  **c)**  **d)** π **2. a)** 0°, 72°, 144°, 216°, 288° **b)** 270° **c)** 90°, 270°  **3. a)**  **b)** no solution **c)**  **4.** 135°, 45°, 45°, 135° **5.**  **6.** The error was in dividing 1 by 2.    **7.** **a)** The student used 2π rather than π; because the equation is sin 2*x*  1, the period of the function is π.  **b)** *n* ∈ I  **8.  9.**  *n* ∈ I  **10.** 60°, 120°, 240°, 300° Gen Sol: 60°  180°*n*, 120°  180°*n*; *n* ∈ I |