DigiPen Institute of Technology Singapore

IBF– Day 1 Exericse
PreCalculus

Instructor: Yilin Wu

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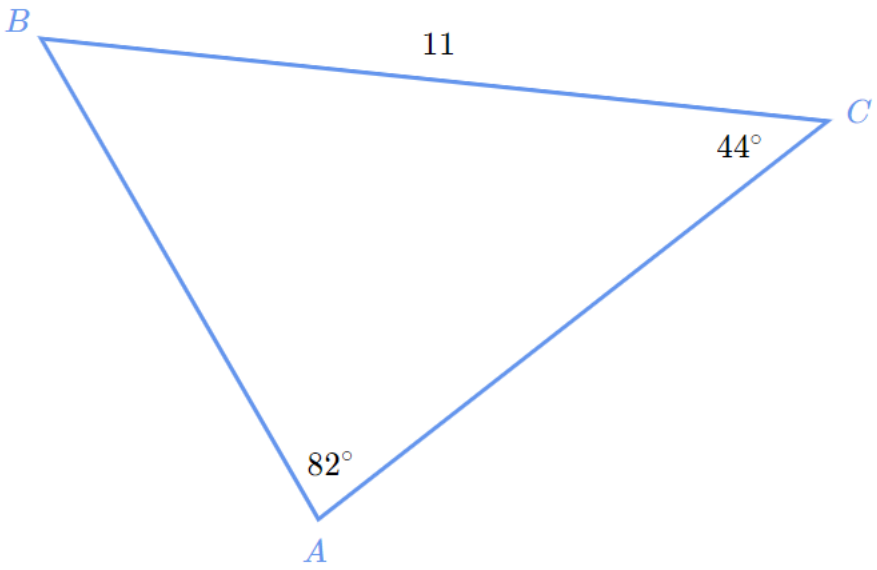
Name: _____

This exercise contains 9 pages (including this cover page) and 15 questions. Total of points is 105. Good luck and Happy reading work!

Distribution of Marks

Question:	1	2	3	4	5	6	7	8
Points:	5	5	5	10	10	5	10	5
Score:								
Question:	9	10	11	12	13	14	15	Total
Points:	5	10	5	5	10	10	5	105
Score:								

1. (5 points) Using the Law of Sine, find the length of AB, AC and the measure of angle B .



2. (5 points) Find the slope-intercept form of the equation of the line which passes through the point$(7, -4)$ and which is parallel to the line through the points $(6, 3)$ and $(4, -1)$.

3. (5 points) Solve the inequality $3\sqrt{x} - 1 < 5$.

4. (10 points) If $f(x) = x^2 + 4$ and $g(x) = \sqrt{2x - 3}$, find $(f \circ g)(x)$ and $(g \circ f)(x)$.

5. (10 points) Find the minimum value of the function $g(x) = x^2 - 8x + 25$, and find the values of x for which $g(x)$ is a minimum.

6. (5 points) Solve the logarithmic equation. Round to the nearest hundredth, if needed

$$18 = \ln(x - 6)^2 + 6$$

7. (10 points) Use a right triangle and the value of the given trigonometric function to find **all** other trig functions of acute angle θ

   1. $\cos\theta = \frac{9}{\sqrt{85}}$

   2. $\sec\theta = \frac{\sqrt{51}}{7}$

8. (5 points) Find $\cos\theta$ and $\csc\theta$, given that $\sin\theta = \frac{\sqrt{5}}{7}$ and $\sec\theta > 0$

9. (5 points) Simplify the expression

$$\ln\left(\frac{x^4}{(2x-1)^3(7x-5)^8}\right)$$

10. (10 points) Find **all solutions** of $\log_3(5-x)+\log_3(3-x)=\log_3(19-5x)$.

11. (5 points) Simplify the expression $\sqrt{9-x^2}$ for $x = 3\sin\theta$ with **Pythagorean Identities** for $-\pi/2 \leq \theta \leq \pi/2$.

12. (5 points) Find $\cos 15^\circ$ using **Sum and Difference Formula**.

13. (10 points) Solve the equation $\cos^2\theta + \cos\theta = 0$ for $0 \leq \theta < 2\pi$.

14. (10 points) Find $\sin 2\theta$ if $\sin\theta = 5/13$ and $\tan\theta < 0$ with **Double Angle Formula**.

15. (5 points) **Sketch** and find the **angle of elevation** if you are standing 400 ft. away and the building is 850 ft. tall?

This page is intentionally left blank to accommodate work that wouldn't fit elsewhere and/or scratch work.