TMUA Practice - Trigonometry

1. What is the largest solution for x in the range $0 \leq x < 2\pi$ for the following equation:

$$2sin\left(2x - \frac{\pi}{3}\right) + 1 = 0$$

A $\frac{\pi}{12}$ B $\frac{3\pi}{4}$ C $\frac{13\pi}{12}$ D $\frac{7\pi}{4}$ E $\frac{23\pi}{12}$

2. What is the sum of the solutions for x in the range $0 \leq x < \pi$ for the following equation:

$$tan\left(2x - \pi\right) = 1$$

A $\frac{\pi}{8}$ B $\frac{5\pi}{8}$ C $\frac{3\pi}{4}$ D $\frac{5\pi}{4}$ E $\frac{7\pi}{4}$

3. How many solutions does the following equation have in the range $0 \leq x < 2\pi$

$$2sin(cosx) = \sqrt{2}$$

A 0
B 1
C 2
D 3
E infinitely many

4. x satisfies the simultaneous equations $2\sqrt{2}sin3x - tan3x = 3$

$\sqrt{2}tan3x + 4sin3x = \sqrt{2}$

where $0 \leq x \leq 180$.

Find the sum of the possible values of x

A 150
B 210
C 315
D 360
E 540

5. Consider the inequality $sin\left(x + \frac{\pi}{3}\right) \geq \frac{1}{2}$

The fraction of the interval $0 \leq x \leq 2\pi$ for which this is true, is:

A $\frac{1}{6}$ B $\frac{1}{4}$ C $\frac{1}{3}$ D $\frac{5}{12}$ E $\frac{1}{2}$

6. Find the greatest value of the function $f(x) = \left(3sin^2(2x - 5) - 7\right)^2$

A 16 B 25 C 36 D 49 E 100

7. Find the maximum value of $3(4^{sinx}) - 10(2^{sinx}) + 9$

A $\frac{2}{3}$ B 1 C 2 D $\frac{19}{4}$ E 9

8. Which of the following is the largest?

A $tan(\frac{5\pi}{4})$ B $sin^2(\frac{3\pi}{4})$ C $log_{10}(\frac{5\pi}{4})$ D $log_2(\frac{3\pi}{4})$

9. A triangle ABC is drawn with AC = 5cm and BC = 11cm and the angle at B equal to a specified angle θ.

Of the two possible triangles that could be drawn, the larger triangle has double the area of the smaller one.

What is the value of $cos\theta$?

A $\frac{10}{11}$ B $\frac{3\sqrt{12}}{11}$ C $\frac{\sqrt{13}}{11}$ D $\frac{\sqrt{6}}{5}$ E $\frac{3\sqrt{6}}{25}$

10. A triangle ABC is to be drawn with the following measurements.

AB = 10cm and angle BAC = 60°.

Which of the following statements is/are true ?

I No such triangle can be drawn if $BC = 7cm$

II Exactly one distinct triangle can be drawn if $BC = 5\sqrt{3}cm$

III Exactly two distinct triangles can be drawn if $BC = 12cm$

A none of them

B I only

C II only

D III only

E I and II only

F II and III only

G I and III only

H I, II and III