UNIT 21 QUESTIONS 16-20

TRIG

1999 17. Let $P(x)$ be a polynomial such that when $P(x)$ is divided by $x-19$, the remainder is 99, and when $P(x)$ is divided by $x-99$, the remainder is 19. What is the remainder when $P(x)$ is divided by $(x-19)(x-99)$?

(A) $-x+80$ **(B)** $x+80$ **(C)** $-x+118$ **(D)** $x+118$ **(E)** 0

2007A 17. Suppose that $\sin a + \sin b = \sqrt{5/3}$ and $\cos a + \cos b = 1$. What is $\cos(a-b)$?

(A) $\sqrt{\frac{5}{3}} - 1$ **(B)** $\frac{1}{3}$ **(C)** $\frac{1}{2}$ **(D)** $\frac{2}{3}$ **(E)** 1

1999 18. How many zeros does $f(x) = \cos(\log(x))$ have on the interval $0 < x < 1$?

(A) 0 **(B)** 1 **(C)** 2 **(D)** 10 **(E)** infinitely many

2007B 19. Rhombus $ABCD$, with side length 6, is rolled to form a cylinder of volume 6 by taping $\overline{AB}$ to $\overline{DC}$. What is $\sin(\angle ABC)$?

(A) $\frac{\pi}{9}$ **(B)** $\frac{1}{2}$ **(C)** $\frac{\pi}{6}$ **(D)** $\frac{\pi}{4}$ **(E)** $\frac{\sqrt{3}}{2}$

2014A 20. In $\triangle BAC$, $\angle BAC = 40°$, $AB = 10$, and $AC = 6$. Points D and E lie on $\overline{AB}$ and $\overline{AC}$, respectively. What is the minimum possible value of $BE + DE + CD$?

(A) $6\sqrt{3} + 3$ **(B)** $\frac{27}{2}$ **(C)** $8\sqrt{3}$ **(D)** 14 **(E)** $3\sqrt{3} + 9$