1) The reference angle of the angle $\theta = 1917^\circ$ is equal to:

A) 63°

B) 17°

C) 37°

D) 73°

E) 33°

2) The arc length S that subtends a central angle $\theta = 40^\circ$ in a circle of diameter $30\,cm$ is equal to:

A) $\frac{10\,\pi}{3}\,cm$

B) $\frac{20\,\pi}{3}\,cm$

C) $600\,cm$

D) $1200\,cm$

E) $\frac{4}{3}\pi\,cm$

3) If the wheels of a car with radius 0.25 meters are rotating at 600 revolutions per minute, then the linear speed of the car in meters per second is:

A) 5π

B) 1.5

C) 25π

D) 600

E) 20π

4) From a point on the ground $100\sqrt{3}\ ft$ from the base of a building, an observer finds that the angle of elevation to the top of the building is 30° and that the angle of elevation to the top of a flagpole on top of the building is α, with $\tan\alpha = \frac{21}{20\sqrt{3}}$. Find the length of the flagpole.

A) 5 feet

B) 4 feet

C) 6 feet

D) 3 feet

E) 7 feet

5) If $\cot\theta = \frac{1}{4}$, $\sin\theta < 0$, then $\cos\theta + \sin\theta =$

A) $-\frac{5\sqrt{17}}{17}$

B) $\frac{\sqrt{17}}{17}$

C) $-\frac{\sqrt{17}}{17}$

D) $\frac{4\sqrt{17}}{17}$

E) -5

6) If the terminal side of an angle θ in standard position is defined by $3x + 2y = 0$, $x \leq 0$, then $\csc\theta + \sec\theta =$

A) $-\frac{\sqrt{13}}{6}$

B) $\frac{\sqrt{13}}{2}$

C) $-\sqrt{13}$

D) $-\frac{6\sqrt{13}}{13}$

E) $5\sqrt{13}$

7) $\cos(-690^\circ) + 2\tan\left(\frac{23\pi}{3}\right) =$

A) $-\frac{3\sqrt{3}}{2}$

B) $-\frac{\sqrt{2}}{2}$

C) $\frac{\sqrt{2}}{2}$

D) $-\frac{\sqrt{3}}{4}$

E) $\frac{\sqrt{3}}{4}$

8) If $f(x) = -|x - 3| + 2$, $x \geq 3$, then the domain of $f^{-1}(x)$ is:

A) $(-\infty, 2]$

B) $(-\infty, \infty)$

C) $(-\infty, 3]$

D) $[3, \infty)$

E) $[2, \infty)$

9) If the inverse function of $f(x) = x^2 + 4x\,;\ x \geq -2$, is given by $f^{-1}(x) = -2 + a\sqrt{bx + c}$, then $a + b + c =$

A) 6

B) 4

C) 5

D) 3

E) 7

10) The sum of all the solution(s) of $27^{x} = (\sqrt{3})^{4x+6}$ is:

A) 3

B) 4

C) -3

D) $-\frac{3}{2}$

E) $\frac{1}{2}$

11) The sum of all the solution(s) of $\dfrac{8^x + 3(8^{-x})}{8^x - 8^{-x}} = 5$ is:

A) $\frac{1}{6}$

B) $\frac{1}{4}$

C) $\frac{1}{3}$

D) $\frac{2}{3}$

E) $\frac{1}{2}$

12) The graph of the function $y = \log_2 |x - 4| - 1$ is above the x-axis on:

A) $(-\infty, 2) \cup (6, \infty)$

B) $(-\infty, 4) \cup (8, \infty)$

C) $(2, 6)$

D) $(-\infty, 6)$

E) $(2, \infty)$

13) If $f(x) = \frac{10^x + 1}{10^x - 1}$, then the inverse function of f is:

A) $f^{-1}(x) = \log\left(\frac{x + 1}{x - 1}\right)$

B) $f^{-1}(x) = \log\left(\frac{2x + 1}{2x - 1}\right)$

C) $f^{-1}(x) = \log(x - 1)$

D) $f^{-1}(x) = \log(x + 1)$

E) $f^{-1}(x) = \log\left(\frac{x + 10}{x - 10}\right)$

14) If $\log_6 3 = a$, then $\log_3 54 =$

A) $\frac{2a + 1}{a}$

B) $2a + 1$

C) $3a + 1$

D) $\frac{a + 2}{a}$

E) $\frac{2a + 3}{a}$

15) The expression $\left(\sqrt[4]{e}\right)^{2\frac{\log 16}{\log e}}$ simplifies to:

A) 4

B) 2

C) 1

D) $\frac{1}{4}$

E) $\frac{1}{2}$

16) The sum of all the solution(s) of the equation $\log_{(x^2+2x)} 27 = 3$ is:

A) - 2

B) - 4

C) - 3

D) 4

E) 1

17) The sum of all the solution(s) of the equation

$\log_2 \sqrt{x-2} + \log_4 (x-1) = \frac{1}{2}$ is:

A) 3

B) - 1

C) - 4

D) 0

E) 1

18) If $(a, 0)$ is the x - intercept and $(0, b)$ is the y - intercept of the function $f(x) = -2^{-x+1} + 16$, then $a + b =$

A) 11

B) - 10

C) 16

D) 12

E) - 8

19) The domain of $f(x) = \ln\left(\frac{3}{4 - x^2}\right)$ is:

A) $(-2, 2)$

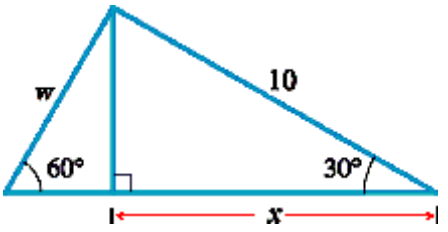
B) $(-2, 0) \cup (0, 2)$

C) $(-2, 0)$

D) $(0, 2)$

E) $(-\infty, -2) \cup (2, \infty)$

20) In the adjacent figure, $x + w$ =



A) $\frac{25\sqrt{3}}{3}$

B) $\frac{\sqrt{3}}{3}$

C) $\frac{5\sqrt{3}}{3}$

D) $\frac{35\sqrt{3}}{2}$

E) $20\sqrt{3}$