1) If $f^{-1}(x) = \dfrac{4x+1}{x-3}$ is the inverse function of $f(x) = \dfrac{ax+b}{x+c}$, then $a+b+c =$

A) 0

B) 2

C) 8

D) -1

E) -2

2) If $f(x) = -\sqrt{x+1}$, then the interval over which the graph of $f^{-1}(x)$ is below the x–axis is

A) $(-1, 0]$

B) $(-1, 1)$

C) $[0, 1)$

D) $(1, \infty)$

E) $(-\infty, -1)$

3) If $(a, 0)$ and $(b, 0)$ are the x–intercepts and $(0, c)$ is the y–intercept for the graph of $y = 3^{|x-2|} - 3$, then $\frac{a+b}{c} =$

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

B) 1

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

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

E) 2

4) If $f(x) = a^x$ is an exponential function with $f^{-1}\left(\frac{1}{2}\right) = -3$, then $f^{-1}(4) =$

A) 6

B) -24

C) $3\sqrt[3]{2}$

D) $2\sqrt[3]{2}$

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

5) The **range** of the function $f(x) = 3 - \left(\frac{1}{e}\right)^{1-x}$ is

A) $(-\infty, 3)$

B) $(3, \infty)$

C) $[2, 3)$

D) $[3, 4)$

E) $[0, \infty)$

6) Which one of the following statements is TRUE about the graph of the function $f(x) = -\log(x-2)^2$

A) The sum of the x–intercepts for graph of f is 4

B) The graph of f is below the x–axis on the interval $(-\infty, 2)$

C) The graph of f is increasing on the interval $(2, \infty)$

D) The domain of f is $[2, \infty)$

E) The range of f is $(-\infty, 2)$

7) If the adjacent figure represents the graph of $y = \log_a (b - x) + c$, then $a + b + c =$

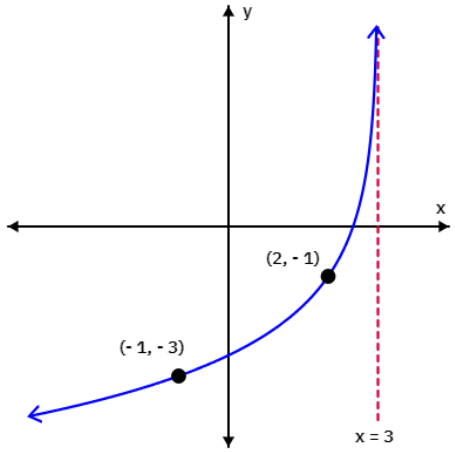
A) $\frac{5}{2}$

B) $\frac{9}{2}$

C) 4

D) 6

E) 3



8) If $\log_2 (\frac{1}{3}) = x$, then $\log_3 \sqrt{72} =$

A) $-\frac{3}{2x} + 1$

B) $-\frac{3x}{2} + 1$

C) $\frac{3x}{2} - 1$

D) $-\frac{1}{2x} + 1$

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

9) $\left(\ln e^2 + \log_{\frac{4}{3}} \sqrt[3]{\frac{9}{16}} \right)^{\log_{\frac{3}{4}}(2)} =$

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

B) $\frac{4}{3}$

C) 2

D) $-\frac{1}{2}$

E) -2

10) The **product** of all solution(s) of the equation $2\left(3^{1+x}\right) + 3^{-x} - 5 = 0,$ is

A) $\log_3 2$

B) $-\log_3 2$

C) $-\log_3 6$

D) $\log_3 6$

E) $-\log_3 5$

11) The **sum** of all solution(s) of the equation $\left(\sqrt[3]{4}\right)^{-|x-1|} = \left(\frac{1}{8}\right)^{2}$ is

A) 2

B) 8

C) 10

D) 18

E) 4

12) The **solution set** of the equation $\log_{8x} 4 + \log_{2} 2x = e^{-\ln 1}$ contains

A) two positive real numbers

B) two negative real numbers

C) one positive real number only

D) one negative real number only

E) no real numbers

13) If an arc length of $3\,\text{cm}$ subtends a central angle of measure $12°$ in a circle of radius r, then $\pi \cdot r =$

A) 45 cm

B) 60 cm

C) 36 cm

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

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

14) A wheel rotates at the rate of 60 revolution per minute. The angle θ through which a point on the edge of the wheel moves in $\frac{1}{3}$ second is

A) $120°$

B) $90°$

C) $180°$

D) $360°$

E) $60°$

15) If the angle of depression from the top of a $10\sqrt{3}$ m high tower to a point on ground is $30°$, then the distance, in meters, from the point to the base of the tower is

A) 30

B) $10\sqrt{3}$

C) $\sqrt{3}$

D) 10

E) $10\sqrt{6}$

16) In the adjacent figure , if $\alpha = \frac{\pi}{3}$, then the value of x is

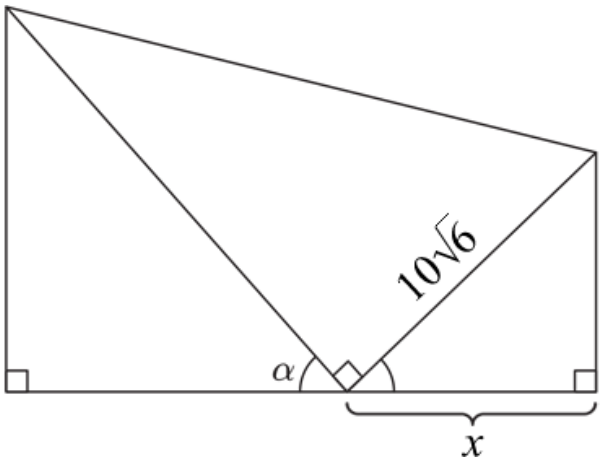
A) $15\sqrt{2}$

B) $5\sqrt{6}$

C) $10\sqrt{3}$

D) $5\sqrt{3}$

E) $10\sqrt{6}$



17) The exact value of $\sec\left(\frac{19\pi}{3}\right)\cot(690°) - \cos(-990°)$ is

A) $-2\sqrt{3}$

B) $2\sqrt{3}+1$

C) $\frac{2\sqrt{3}}{3}+1$

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

E) -1

18) If $\cot\theta = \sqrt{\frac{5}{3}}$ and $\cos\theta < 0$, then $\csc\theta =$

A) $-\frac{2\sqrt{6}}{3}$

B) $\frac{2\sqrt{6}}{3}$

C) $-\frac{8\sqrt{3}}{3}$

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

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

19) If $f(x) = \sin(x)$ and $g(x) = \cot(\cos x) + x^2 \csc x$, then

A) f is an odd function and g is neither even nor odd function

B) f is an even function and g is neither even nor odd function

C) f is an odd function and g is an even function

D) f is an odd function and g is an odd function

E) f is an even function and g is an odd function

20) If $\cos\theta = v$ and θ is in the **third quadrant**, then $\tan\theta =$

A) $-\dfrac{\sqrt{1-v^2}}{v}$

B) $\dfrac{\sqrt{1-v^2}}{v}$

C) $-\dfrac{\sqrt{v^2-1}}{v}$

D) $\dfrac{\sqrt{v^2-1}}{v}$

E) $\dfrac{\sqrt{1+v^2}}{v}$

Answer Key
Testname: MATH012_E1_241

1) A
2) A
3) A
4) A
5) A
6) A
7) A
8) A
9) A
10) A
11) A
12) A
13) A
14) A
15) A
16) A
17) A
18) A
19) A
20) A