1. Which one of the following statements is **FALSE** about the function $S(x) = -2 + 2e^{-x}$?

See example 1 P. 312

(a) S has a graph asymptotic to the x-axis

(b) S has the interval $(-2, \infty)$ as its range

(c) S has a graph that passes through the origin

(d) S is a decreasing function

(e) S is a one-to-one function

2. The domain of the function $f(x) = \log\left(\dfrac{x-2}{x+5}\right)$ is equal to

See example 6 P 324

Problems 41 & 50 P. 328

(a) $(-\infty, -5) \cup (2, \infty)$

(b) $(-5, 2)$

(c) $(-2, 5)$

(d) $(-\infty, -2) \cup (5, \infty)$

(e) the set of all real numbers $x \neq 2, -5$

3. $\log_{\frac{1}{2}} 16 + \log_{16} \frac{1}{2} =$

See example 4 p. 322
Problems 21 to 30 p. 327

(a) $-\frac{17}{4}$

(b) $-\frac{19}{4}$

(c) $\frac{21}{4}$

(d) -4

(e) 4

4. Let W be the wrapping function. If $W\left(-\frac{19\pi}{6}\right) = (x, y)$, then $x - y =$

See Examples 1 (p. 424) and 2 (p. 425)
Problems 1 to 12 p. 431

(a) $\frac{1}{2}(-1 - \sqrt{3})$

(b) $\frac{1}{2}(1 + \sqrt{3})$

(c) $\frac{1}{2}(-1 + \sqrt{3})$

(d) $\frac{1}{2}(1 - \sqrt{3})$

(e) $\frac{1}{2}(\sqrt{2} - \sqrt{3})$

5. $\frac{1}{2}\log(y^3 z^4) - 3\log(x\sqrt{y}) + 2\log\frac{x^2}{z} =$

(a) $\log x$

(b) $\log\left(\frac{x}{yz}\right)$

(c) $\log\left(\frac{xy}{z}\right)$

(d) $\log z$

(e) $\log y$

See example 2 P.332
Problems 11 to 20 P.338

6. The product $\log_3 4 \cdot \log_4 5 \cdot \log_5 27$ is equal to

(a) 3

(b) 4

(c) $\frac{27}{5}$

(d) 9

(e) $\frac{27}{4}$

See problems 71 and 72 P.341

7. If $\left(\frac{1}{2}\right)3^x = \frac{1}{3}(2^{-x})$, then $x =$

See example 3 P.344
Problems 1 to 20 P.348

(a) $\frac{\ln 2 - \ln 3}{\ln 6}$

(b) 1

(c) $\frac{(\ln 2)(\ln 3)}{\ln 6}$

(d) $\frac{\ln 6}{\ln 3 - \ln 2}$

(e) $(\ln 2)(\ln 3)(\ln 6)$

8. The solution set of $\log(4-x) = \log(x+8) + \log(2x+13)$ contains

See examples 6 and 7 P. 346
and problems 23 to (30) P.349

(a) one negative integer

(b) two negative integers

(c) one negative and one positive integers

(d) two positive integers

(e) no integers

9. The smallest positive angle in radians that is coterminal with the angle $-255°$ is

(a) $\frac{7\pi}{12}$

(b) $\frac{5\pi}{12}$

(c) $\frac{4\pi}{9}$

(d) $\frac{5\pi}{9}$

(e) $\frac{11\pi}{9}$

See example 2 p. 391

Problems 13 to 18 p. 399

10. If a wheel is rotating at 100 revolutions per minute, then the **angular speed** in radians per second is equal to

(a) $\frac{10\pi}{3}$

(b) $\frac{50\pi}{3}$

(c) $\frac{5\pi}{3}$

(d) $\frac{200\pi}{3}$

(e) $\frac{25\pi}{3}$

See example 7 p. 397

Problems 65 to 72 p. 400

11. If β is an acute angle of a right triangle with $\csc\beta = \frac{13}{12}$, then the exact value of the expression $\frac{\sec\beta - \tan\beta}{\cos\beta + \sin\beta}$ is equal to

See example 2 p. 404
Problems 21 to 26 p. 411

(a) $\frac{13}{85}$

(b) $\frac{11}{25}$

(c) $\frac{1}{169}$

(d) $\frac{17}{60}$

(e) $\frac{25}{168}$

12. If $f(x) = 3e^{-x}$ and $g(x) = \ln\left(\frac{3}{x}\right)$, then $(f \circ g)(x) - (g \circ f)(x) =$

To apply the relations:

$\log_a a^u = u$

and $a^{\log_a u} = u$.

(a) 0

(b) $\frac{9}{x}$

(c) $9x$

(d) $\frac{x}{9}$

(e) $\frac{-2}{x}$

See p. 320

13. An airplane is flying 60000 feet above level ground. The angle of depression from plane to the base of a tree is $\theta°$ where $\sin\theta° = \frac{5}{13}$. How far horizontally must the plane fly directly over the tree?

See example 5 p. 409
problem 67, 68, and 70 p. 412

(a) 144000 feet

(b) 121000 feet

(c) 169000 feet

(d) 225000 feet

(e) 250000 feet

14. The graph of the function $f(x) = 3\log|2x+10|$ is

(a) symmetric about the vertical line $x = -5$

(b) decreasing on $(-5, \infty)$

See problems 73 and 74 p. 328

(c) increasing on $(-\infty, -5)$

(d) having no y-intercepts

(e) having only one x-intercept

15. $\csc t$ written in terms of $\tan t$ for $\pi < t < \frac{3\pi}{2}$ is equal to

See example 6 p. 430
Problems 65 & 68 p. 432

(a) $\frac{-\sqrt{1+\tan^2 t}}{\tan t}$

(b) $\frac{1-\tan t}{\tan t}$

(c) $\frac{\sqrt{1+\tan^2 t}}{\tan t}$

(d) $-\tan t(1+\tan t)$

(e) $-\tan t\sqrt{1+\tan^2 t}$