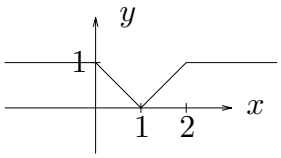
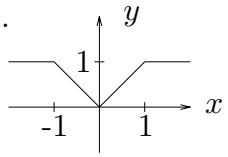
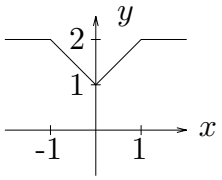
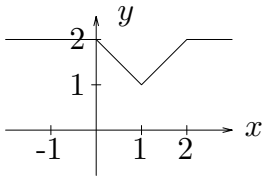
1. The graph of $y = f(x)$ is shown below.

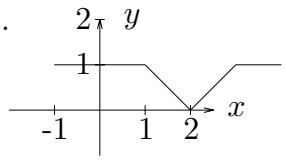


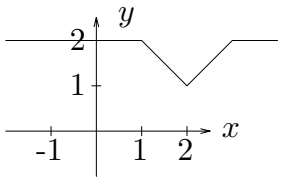
Which is the graph for $y = 1 + f(x + 1)$.

A.


B.


C.


D.


E.


2. Given that $\tan x = -\frac{3}{4}$ and $\frac{3\pi}{2} < x < 2\pi$, find $\cos x$.

A. $-\frac{3}{5}$

B. $\frac{3}{5}$

C. $-\frac{4}{5}$

D. $\frac{4}{5}$

E. $-\frac{\sqrt{7}}{4}$

3. The radius of the circle given by $x^2 + y^2 - 5x + 2y = -\frac{1}{4}$ is

A. $\sqrt{6}$

B. $\sqrt{7}$

C. $\frac{5}{2}$

D. $\sqrt{3}$

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

4. An equation of the line through $(2, 1)$ and perpendicular to $3x + 5y - 1 = 0$ is

A. $5x - 3y + 1 = 0$

B. $3x - 5y - 1 = 0$

C. $5x + 3y - 13 = 0$

D. $5x - 3y - 7 = 0$

E. $3x - 5y + 1 = 0$

5. If $f(x) = x^2 + 2$ and $g(x) = \sqrt{x-1}$, then $(f \circ g)(x) =$

A. $x + 1$

B. $(x^2+2)\sqrt{x-1}$

C. $\sqrt{x^2+1}$

D. $\sqrt{(x-1)(x^2+2)}$

E. $\sqrt{x^2+x+1}$

6. If $f(x) = \dfrac{\sqrt{x}}{x^2-1}$, find the domain of f.

A. $(-\infty,-1)\cup(-1,1)\cup(1,\infty)$

B. $[0,\infty)$

C. $[0,1)\cup(1,\infty)$

D. $(1,\infty)$

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

7. Which of the following statements are true for all values of x.

I. $\dfrac{3^x}{3^y} = 3^{x-y}$

II. $(2+5)^x = 2^x + 5^x$

III. $10^x = 2^x \cdot 5^x$

A. Only I.

B. Only I and II.

C. Only II and III.

D. Only I and III.

E. I, II, and III.

8. Which of the following statements are true for all real values of x?

I. $3^x > 2^x$

II. $3^x > 1$

III. $3^x > 0$

A. Only I.

B. Only II.

C. Only I and II.

D. Only III.

E. I, II, and III

9. The inverse of the function $f(x) = \sqrt{4 + e^{3x}}$ is $f^{-1}(x) =$

A. $\frac{1}{3}\ln(x^2 + 4)$

B. $3\ln(x^2 - 4)$

C. $\frac{1}{3}\ln(x^2 - 4)$

D. $3\ln(x^2 + 4)$

E. $\frac{1}{3}\ln(4 - x^2)$

10. $\lim_{x \to 2^-} \frac{x+1}{x-2} =$

A. ∞

B. $-\infty$

C. 0

D. 3

E. 1

11. $\lim_{x \to 2} \dfrac{2x - x^2}{x^2 - x - 2} =$

A. $-\dfrac{2}{3}$

B. $\dfrac{2}{3}$

C. 0

D. ∞

E. $-\infty$

12. If $1 - (x+1)^2 \leq H(x) \leq \frac{1}{4} - x$ for $-1 < x < 0$, then $\lim_{x \to -\frac{1}{2}} H(x) =$

A. $\dfrac{4}{3}$

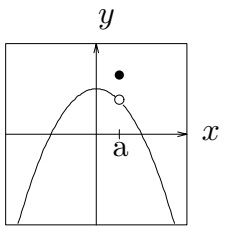
B. $\dfrac{3}{4}$

C. $-\dfrac{3}{4}$

D. $-\dfrac{4}{3}$

E. cannot be determined

13. Let f be given by the graph below.



Then which of the following are true?

1. $\lim_{x \to a} f(x)$ exists.
2. $f(a)$ exists.
3. f is continuous at $x = a$.

A. 1, 2, and 3

B. only 1

C. only 2

D. only 3

E. only 1 and 2

14. $\lim_{x \to \infty} \dfrac{2x^2 - x}{x^2 + 2x - 1} =$

A. 1

B. 2

C. 4

D. ∞

E. $-\infty$

15. $\lim_{x \to -\infty} \dfrac{x^3 - x^2}{1 - x^2} =$

A. ∞

B. $-\infty$

C. 1

D. -1

E. 0