6. The length of the curve $y = \int_2^x \sqrt{t^3 + 2t}$ on the interval $2 \leq x \leq 4$ is

(a) 8
(b) $\frac{3}{2}$
(c) 4
(d) $\frac{1}{2}$

7. The solution set of $\left|\frac{2}{x} - 1\right| < 1$ is

(a) $(0, 1)$
(b) $(1, \infty)$
(c) $(1, 2)$
(d) none of the above

8. The equation of the normal to the a curve $f(x) = x^2 - x + 1$ at $x = 1$ is

(a) $y = -x$
(b) $y = x$
(c) $y = -x + 2$
(d) none of the above

9. If the average value of $y = f(x)$ on the interval $[0, 5]$ is 4 then $\int_0^5 f(x)dx =$

(a) 5
(b) 10
(c) 15
(d) 20

10. If $G(x)$ is an antiderivative of $f(x)$ then $G'(x^2)$

(a) $2xf(x^2)$
(b) $2xf(x)$
(c) $\int_0^{x^2} f(t)dt$
(d) $f(x^2)$

11. The domain of $f(x) = \frac{1}{|x| + |x|}$ is

(a) $R - \{0\}$
(b) $R - \{0, 1, 2, \ldots\}$
(c) $R - \{0, -1, -2, \ldots\}$
(d) $R - \{0, \pm 1 \pm 2 \pm \ldots\}$

12. Use the area to find $\int_0^2 \sqrt{4-x^2}dx =$

(a) $\frac{1}{2}\pi$
(b) 2π
(c) $\frac{\pi}{2}$
(d) $\frac{\pi}{4}$

13. If $\varepsilon = 1$ then the value of δ that satisfies the definition of $\lim_{x\to 2} 5-2x = 1$ is

(a) 1
(b) $\frac{1}{2}$
(c) $\frac{3}{4}$
(d) 2

14. $\frac{d}{dx}\int_1^{10} \sqrt{t^2-1}dt =$

(a) $\sqrt{x^2-1}$
(b) $3\sqrt{10}$
(c) $\sqrt{99}$
(d) 0

15. The closest point on the curve $y = \sqrt{x}$ to the point $(2,0)$ is

(a) $(0,0)$
(b) $\left(\frac{3}{2}, \sqrt{\frac{3}{2}}\right)$
(c) $(1,1)$
(d) $\left(\frac{3}{2}, \frac{9}{4}\right)$

16. A particle moves on the curve $y = x^2$ if the x–coordinate of the particle is changing at a rate of 2 cm/sec then the particle distance from the origin at $x = 2$ is changing at the rate of

(a) $\frac{18}{\sqrt{5}}$cm/sec
(b) 8cm/sec
(c) 4cm/sec
(d) $10\sqrt{5}$cm/sec

17. The function $y = \dfrac{\sin x}{x}$ has

(a) A vertical asymptote which is $x = 0$
(b) A horizontal asymptote which $y = 0$
(c) A horizontal tangent at $x = \pi$.
(d) None of the above.

21- Find the average value of the function $f(x)=\sqrt{x}$ over the interval $[0,4]$

(a) $\frac{1}{3}$ (b) $\frac{2}{3}$ (c) $\frac{4}{3}$ (d) $\frac{10}{3}$

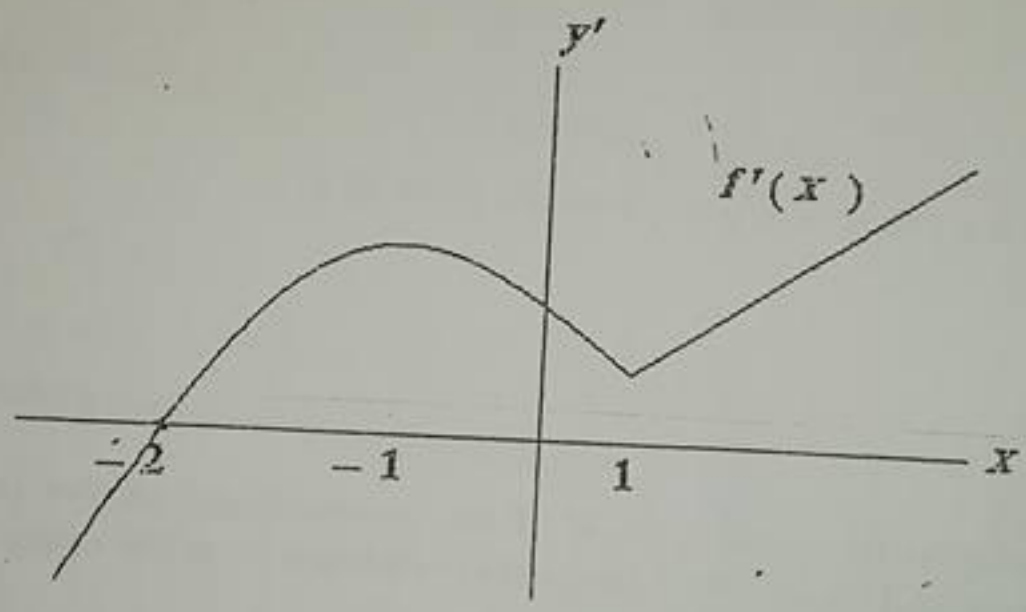
22- If $f(x)=\int_{1}^{x^3}\sqrt{9+t}\,dt$, then find $f'(4)$

(a) 10 (b) 20 (c) 30 (d) 40

23- Find the equation of the tangent line to the curve $x^2+xy-2y^2=0$ at the point $(1,1)$.

(a) $y=x$ (b) $y=x+1$ (c) $y=2x-1$ (d) $y=2-x$

- Here is the graph of $f'(x)$. Use it to answer the questions 24 up to 26.



24- Find the interval or intervals on which f is increasing.

(a) $[-2,\infty)$ (b) $[1,\infty)$ (c) $(-2,1]$ (d) $[-2,1]$

25- Find the values of x where f has a local minimum

(a) -2 (b) -1 (c) 0 (d) 1

26- Find the values of x where f has a critical point.

(a) $-2,-1$ (b) $-1,1$ (c) $-2,-1,1$ (d) -2