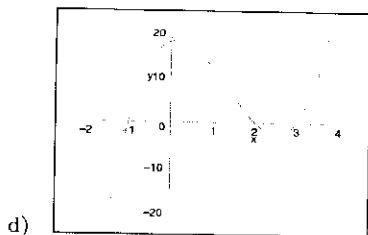
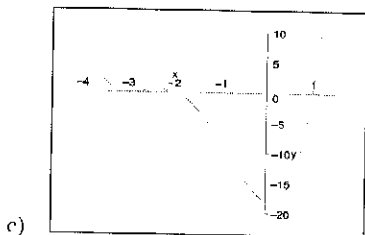
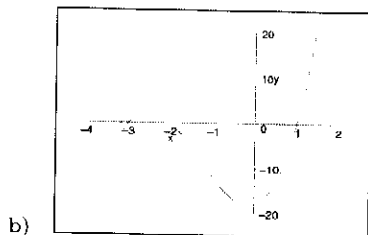
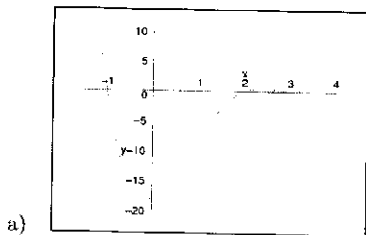


1. Determine the correct end behavior for the function $f(x) = -4x^3 + 3x^2 + 2$.
- as $x \rightarrow \infty f(x) \rightarrow -\infty$, and as $x \rightarrow -\infty f(x) \rightarrow \infty$
 - as $x \rightarrow \infty f(x) \rightarrow -\infty$, and as $x \rightarrow -\infty f(x) \rightarrow -\infty$
 - as $x \rightarrow \infty f(x) \rightarrow \infty$, and as $x \rightarrow -\infty f(x) \rightarrow \infty$
 - as $x \rightarrow \infty f(x) \rightarrow \infty$, and as $x \rightarrow -\infty f(x) \rightarrow -\infty$
4. Use synthetic division and the Remainder Theorem to evaluate $P(11)$ if $P(x) = 2x^5 - 21x^4 - 13x^3 + 23x^2 - 119$.
- 2
 - 108
 - 108
 - 2

2. Determine the correct graph of the function $f(x) = (x-1)(x+2)(x+3)^2$.



3. Determine the quotient and remainder for the division of $4x^4 - 4x^3 - x - 3$ by $x^2 - 2$.

- quotient $4x^2 - 4x$, remainder $-9x - 3$
- quotient $4x^2 + 4x$, remainder $7x - 3$
- quotient $4x^2 - 4x - 8$, remainder $7x + 13$
- quotient $4x^2 - 4x + 8$, remainder $-9x + 13$

5. Find the sum of all zeros of $P(x) = x^3 + 2x^2 - 5x - 6$.

- 2
- 0
- 4
- 2

6. How many unique real zeros does the function $P(x) = x^3 + 2x^2 - 4x - 8$ have?

- 3
- 1
- 2
- 8

7. Find the horizontal and vertical asymptotes of $f(x) = \frac{x+2}{x^2+2x-3}$.

- horizontal asymptote $y = 1$, vertical asymptotes: $x = -3, x = 1$
- horizontal asymptote $y = 1$, vertical asymptotes: $x = 3, x = -1$
- horizontal asymptote $y = 0$, vertical asymptotes: $x = -3, x = 1$
- horizontal asymptote $y = 0$, vertical asymptotes: $x = 3, x = -1$

8. Find the slant asymptote of the function $f(x) = \frac{3x - x^2}{2x - 2}$.

- $y = \frac{1}{2}x - 1$
- $y = -\frac{1}{2}x + 1$
- $y = -2x + \frac{1}{2}$
- $y = 2x - \frac{1}{2}$

9. Find the domain and the range of the function $f(x) = 6 - 3^x$.
- Domain: $(6, \infty)$, Range: $(-\infty, 3)$
 - Domain: $(-\infty, \infty)$, Range: $(-\infty, 6)$
 - Domain: $(-\infty, \infty)$, Range: $(6, \infty)$
 - Domain: $(-\infty, 6)$, Range: $(3, \infty)$
10. Find the domain and range of the function $f(x) = \ln(x + 2)$.
- Domain: $(-\infty, \infty)$, Range: $(-\infty, \infty)$
 - Domain: $(-\infty, \infty)$, Range: $(-\infty, 2)$
 - Domain: $(-2, \infty)$, Range: $(2, \infty)$
 - Domain: $(-2, \infty)$, Range: $(-\infty, \infty)$
11. Evaluate $\log_4 16^{100}$.
- 100
 - 200
 - 400
 - 1600
12. Evaluate $\log_3 100 - \log_3 18 - \log_3 50$.
- 3
 - 2
 - 2
 - 3
13. Solve the equation $\frac{10}{1 + e^{-x}} = 2$ for x .
- $-\ln 4$
 - $\ln 4$
 - $-\ln 8$
 - $\ln 8$
14. Solve the equation $\log_5 x + \log_5(x + 1) = \log_5 20$ for x .
- 4 only
 - 4, -5
 - $\frac{19}{2}$ only
 - 5 only
15. Radium-221 has a half-life of 30 s. How long will it take to decay to only $1/5$ of the original mass?
- 150 s
 - $\frac{30}{\ln 5}$ s
 - $\frac{30 \ln 5}{\ln 2}$ s
 - $\frac{30 \ln 2}{\ln 5}$ s
16. Find the radius of the circle if an arc of length 4 ft on the circle subtends a central angle of 120° .
- 6π ft
 - $\frac{\pi}{12}$ ft
 - $\frac{6}{\pi}$ ft
 - $\frac{12}{\pi}$ ft
17. Evaluate $\sin \frac{\pi}{6} \sin \frac{\pi}{4} + \cos \frac{\pi}{4}$.
- $\frac{3}{4}$
 - $\sqrt{2}$
 - $\frac{\sqrt{2}}{2}$
 - $\frac{3\sqrt{2}}{4}$
18. If $\sec \theta = \sqrt{5}$ and $\sin \theta < 0$, what is $\tan \theta$?
- 5
 - 2
 - 5
 - 2
19. If $b = 13$, $c = 15$ and $\angle B = 30^\circ$, what is $\sin \angle C$?
- $\frac{15}{26}$
 - $\frac{30}{13}$
 - $\frac{26}{15}$
 - $\frac{13}{30}$

20. What is c^2 if $a = 3$, $b = 4$ and $\angle C = 53^\circ$?

- a) $25 + 24 \cos 53^\circ$
- b) $7 - 12 \cos 53^\circ$
- c) $7 + 12 \cos 53^\circ$
- d) $25 - 24 \cos 53^\circ$

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