

## Summer Assignments for Calculus Honors

### Chapter P

1. Find all intercepts of the graph of  $y = \frac{x+2}{x-3}$ .

- |                                  |                       |                                |
|----------------------------------|-----------------------|--------------------------------|
| (a) $(-2, 0)$                    | (b) $(-2, 0), (3, 0)$ | (c) $(0, \frac{2}{3}), (3, 0)$ |
| (d) $(-2, 0), (0, -\frac{2}{3})$ | (e) None of these     |                                |

2. Determine if the graph of  $y = \frac{x}{x^2-4}$  is symmetrical with respect to the x-axis, the y-axis, or the origin.

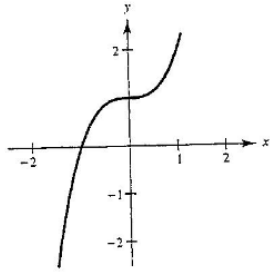
- |                      |                      |                      |
|----------------------|----------------------|----------------------|
| (a) About the x-axis | (b) About the y-axis | (c) About the origin |
| (d) All of these     | (e) None of these    |                      |

3. Find all points of intersection of the graphs of  $x^2 - 2x - y = 6$  and  $x - y = -4$ .

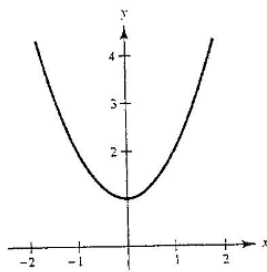
- |                        |                          |                       |
|------------------------|--------------------------|-----------------------|
| (a) $(0, -6), (0, 4)$  | (b) $(10, 14), (13, 17)$ | (c) $(5, 9), (-2, 2)$ |
| (d) $(-5, -1), (2, 6)$ | (e) None of these        |                       |

4. Which of the following is a sketch of the graph of the function  $y = x^3 + 1$ ?

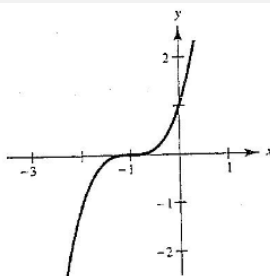
(a)



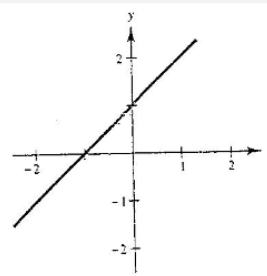
(b)



(c)



(d)



(e) None of these

5. Find an equation for the line passing through the point (4, -1) and perpendicular to the line  $2x - 3y = 3$ .

- |                            |                       |                    |
|----------------------------|-----------------------|--------------------|
| (a) $y = \frac{2}{3}x - 1$ | (b) $3x + 2y + 2 = 0$ | (c) $2x + 3y = 10$ |
| (d) $3x + 2y = 10$         | (e) None of these     |                    |

6. Find the domain of  $f(x) = \frac{1}{\sqrt{3-2x}}$

- |   |                             |                             |
|---|-----------------------------|-----------------------------|
| (a) $(-\infty, \frac{2}{3})$                            | (b) $[\frac{3}{2}, \infty)$ | (c) $(\frac{3}{2}, \infty)$ |
| (d) $(-\infty, \frac{3}{2}) \cup (\frac{3}{2}, \infty)$ | (e) None of these           |                             |

7. Find  $f(x + \Delta x)$  for  $f(x) = x^3 + 1$ .

- |                              |  |
|------------------------------|--|
| (a) $x^3 + 1 + \Delta x$     | (b) $x^3 + 3x^2(\Delta x) + 3x(\Delta x)^2 + (\Delta x)^3 + 1$ |
| (c) $x^3 + (\Delta x)^3 + 1$ | (d) $\Delta^2 x^6 + 1$   |
| (e) None of these            |  |

8. If  $f(x) = \frac{1}{\sqrt{x}}$  and  $g(x) = 1 - x^2$ , find  $f(g(x))$ .

- |                                    |                                |                       |
|------------------------------------|--------------------------------|-----------------------|
| (a) $\frac{1 - x^2}{\sqrt{x}}$     | (b) $\frac{1}{\sqrt{1 - x^2}}$ | (c) $1 - \frac{1}{x}$ |
| (d) $\frac{1}{\sqrt{x}} + 1 - x^2$ | (e) None of these              |                       |

9. If the point  $(-3, \frac{1}{2})$  lies on the graph of the equation  $2x + ky = -11$ , find the value of k.

- |                    |                   |                     |
|--------------------|-------------------|---------------------|
| (a) $-\frac{5}{2}$ | (b) -34           | (c) $-\frac{17}{2}$ |
| (d) -10            | (e) None of these |                     |

10. Which of the following equations expresses y as a function of x?

- |                                   |                      |                                |
|-----------------------------------|----------------------|--------------------------------|
| (a) $3y + 2x - 9 = 17$            | (b) $2x^2y + x = 4y$ | (c) Both <b>a</b> and <b>b</b> |
| (d) Neither <b>a</b> nor <b>b</b> | (e) $3y^2 - x^2 = 5$ |                                |

11. Given  $f(x) = x^2 - 3x + 4$ , find  $f(x + 2) - f(2)$ .

- |                    |                   |                   |
|--------------------|-------------------|-------------------|
| (a) $x^2 - 3x + 4$ | (b) $x^2 + 2$     | (c) $x^2 + x - 8$ |
| (d) $x^2 - 3x - 4$ | (e) None of these |                   |

12. Determine which function is neither even nor odd.

- |                             |                                |                            |
|-----------------------------|--------------------------------|----------------------------|
| (a) $f(x) = \tan x$         | (b) $f(x) = 3x^5 + 5x^3 + 1$   | (c) $f(x) = \frac{3}{x^2}$ |
| (d) $f(x) = \sqrt{x^2 + 1}$ | (e) Both <b>a</b> and <b>b</b> |                            |

13. Find the point that lies on the line determined by the points (1, -2) and (-3, 1).

- |             |             |             |
|-------------|-------------|-------------|
| (a) (0, 0)  | (b) (5, 1)  | (c) (4, -6) |
| (d) (5, -5) | (e) (-2, 0) |             |

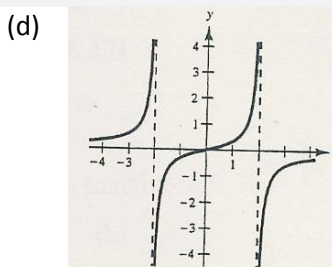
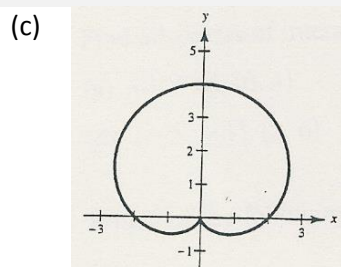
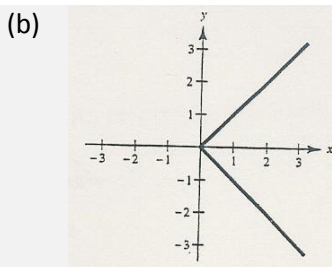
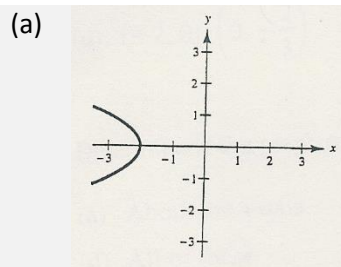
14. Determine the slope of the line given by the equation  $9x - 5y = 11$ .

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|--------------------|--------------------|-------------------|
| (a) $\frac{5}{9}$  | (b) $-\frac{5}{9}$ | (c) $\frac{9}{5}$ |
| (d) $-\frac{9}{5}$ | (e) -9             |                   |

15. Describe the transformation needed to sketch the graph of  $y = \frac{1}{x-2}$  using the graph of  $f(x) = \frac{1}{x}$ .

- (a) Shift  $f(x)$  two units to the right.
- (b) Shift  $f(x)$  two units to the left.
- (c) Shift  $f(x)$  two units upward.
- (d) Shift  $f(x)$  two units downward.
- (e) Reflect  $f(x)$  about the x-axis.

16. Use the vertical line test to determine which of the following graphs represent  $y$  as a function of  $x$ .



- (e) None of these

17. Let  $f(x) = \begin{cases} \frac{1}{x} & x < 0 \\ 2x + 1, & x \geq 0 \end{cases}$ . Find  $f(3)$ .

- |                   |                    |       |
|-------------------|--------------------|-------|
| (a) $\frac{1}{3}$ | (b) 1              | (c) 7 |
| (d) Undefined     | (e) $\frac{22}{3}$ |       |

18. The dollar value of a product in 1998 is \$1430. The value of the product is expected to increase \$83 per year for the next 5 years. Write a linear equation that gives the dollar value  $V$  of the product in terms of the year  $t$ . (Let  $t = 8$  represent 1998.)

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|----------------------------|----------------------------|----------------------|
| (a) $V = 1430 + 83(t - 8)$ | (b) $V = 83 + 1430t$       | (c) $V = 1430 + 83t$ |
| (d) $V = 83 + 1430(t + 8)$ | (e) $V = 1430 + 83(t + 8)$ |                      |

19. During the first and second quarters of the year, a business had sales of \$150,000 and \$185,000, respectively. If the growth of sales follows a linear pattern, what will sales be during the fourth quarter?

- |               |                   |               |
|---------------|-------------------|---------------|
| (a) \$220,000 | (b) \$235,000     | (c) \$335,000 |
| (d) \$255,000 | (e) None of these |               |

20. In order for a company to realize a profit in the manufacture and sale of a certain item, the revenue,  $R$ , for selling  $x$  items must be greater than the cost,  $C$ , of producing  $x$  items. If  $R = 79.99x$  and  $C = 61x + 1050$ , for what values of  $x$  will this product return a profit?

- |                 |                   |                 |
|-----------------|-------------------|-----------------|
| (a) $x \geq 55$ | (b) $x \geq 8$    | (c) $x \geq 18$ |
| (d) $x \geq 56$ | (e) None of these |                 |