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- 1) If the distance between $(x, 3)$ and $(4, 1)$ is 5, what is the value of x ?
- 2) What is the radius of a circle centered at $(1, 3)$ and contains the point $(3, 3)$?
- 3) Graph the following equation:
 - a) $y = 4x - 4$
 - b) $2x + 3y = -3$
- 4) Find an equation of the line that passes through the point $(2, 4)$ and is perpendicular to the following line:
 $3x + 4y - 22 = 0$
- 5) Given that the point $(-3, 5)$ lies on the line given by the equation $kx + 3y + 9 = 0$, find k .
- 6) For the Function described by $f(x) = \sqrt{x - 2}$, find:

$$\lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$$

- 7) Determine if the following are functions, and if so, what is the domain of each?
 - a) $x^2 + y^2 = 4$
 - b) $\frac{2t}{t^2 - 1}$
 - c) $4 - x^2$
- 8) Sketch the graph of $y = x^2 - 4x - 12$, and label the vertex and intercepts.
- 9) Write the equation of a parabola that has been shifted left one unit, up 4 units, then reflected across the x -axis.
- 10) A study prepared for a Sunbelt town's Chamber of Commerce projected that the population of the town in the next 3 years will grow according to the rule
$$P(x) = 50000 + 30x^{\frac{3}{2}} + 20x$$
where $P(x)$ denotes the population x months from now. By how much will the population increase during the next 9 months? How much during the next 16 months?

- 11) Determine the compositions of the following pair of functions and their domain's:

$$f(x) = \sqrt{1 - 4x} \quad \text{and} \quad g(x) = \frac{1}{x^2}$$

- a) $f(g(x))$
- b) $g(f(x))$

- 12) Evaluate the following limits, if they exist:

- a) $\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2}$
- b) $\lim_{x \rightarrow \infty} \frac{-4x^5 - 3x^2 + 1}{2x^4 + x^3 + x^2 + x + 1}$



- 13) A manufacturer has a monthly fixed cost of \$100,000 and a production cost of \$14 for each unit produced. The product sells for \$20/unit.
- What is the cost function?
 - What is the revenue function?
 - What is the profit function?
- 14) When a new CD is marketed at FYE, market figures show that an average of 250 will sell when the price is \$15, and an average of 300 will sell when the price is reduced by \$1. Assuming the demand function is linear,
- Find p as a function of x .
 - Express the company's revenue as a function of x .
 - What is the maximum revenue possible?
 - Assuming the supply function is given by $s(x) = 0.02x + 8$, find the equilibrium quantity and price.
- 15) Given that...

$$f(x) = \begin{cases} px^2 & \text{if } x < -1 \\ x - 2 & \text{if } x = -1 \\ 2 + qx & \text{if } x > -1 \end{cases}$$

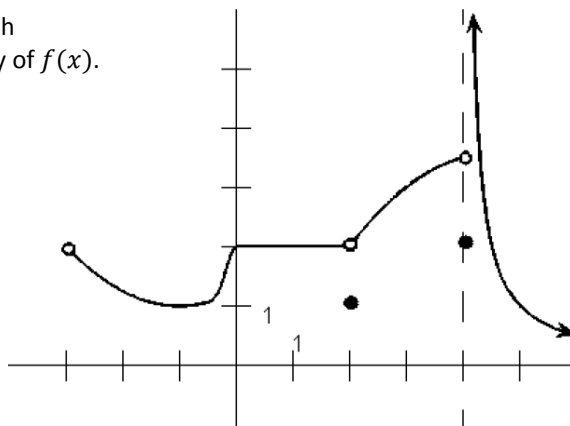
Find p and q to make $f(x)$ continuous at $x = -1$.

- 16) Consider the following function,

$$f(x) = \begin{cases} |x + 2| & \text{if } -3 \leq x < 1 \\ -3 & \text{if } x = 1 \\ 2 + \sqrt{x} & \text{if } x > 1 \end{cases}$$

- Find the domain of the function.
 - Graph the function.
 - What is the limit of f as x approaches 1?
- 17) Refer to the graph below to determine whether each statement is true or false, and discuss the continuity of $f(x)$.

- $\lim_{x \rightarrow -3^+} f(x) = 2$
- $\lim_{x \rightarrow 0} f(x) = 2$
- $\lim_{x \rightarrow 2} f(x) = 1$
- $\lim_{x \rightarrow 4^-} f(x) = 3$
- $\lim_{x \rightarrow -4^+} f(x)$ does not exist.
- $\lim_{x \rightarrow 4} f(x) = 2$



- 18) Given that...

$$f(x) = \frac{|x + 1|}{x^3 + x^2}$$

- Write the function in a piecewise fashion and then find...
- $\lim_{x \rightarrow -1^-} f(x)$
- $\lim_{x \rightarrow -1^+} f(x)$
- $\lim_{x \rightarrow -1} f(x)$
- $\lim_{x \rightarrow 0^-} f(x)$
- $\lim_{x \rightarrow 0^+} f(x)$