

Question 1: Find and simplify $f(a + 2)$ if $f(x) = -x^2 + 4x + 1$.

[3]

Question 2:

(i) Find the equation of the line through the points $(5, -3)$ and $(1, -7)$

[3]

(ii) Graph the line through the point $(2, -1)$ having undefined slope.

[2]

(iii) Find the y -intercept of the line of slope $m = 0$ through the point $(-7/3, 3)$.

[2]

Question 3: Find the equation of the line having x -intercept $(3, 0)$ and y -intercept $(0, -2)$.

[3]

Question 4: Find an equation of the line through the point $(1, 6)$ that is perpendicular to the line $3x + 5y = 1$.

[3]

Question 5: Find the value of k so that the line through $(3, -2)$ and $(k, 3)$ is parallel to the line $3y + 2x = 6$.

[4]

Question 6: The relationship between temperature expressed in degrees Celsius ($^{\circ}\text{C}$) and degrees Fahrenheit ($^{\circ}\text{F}$) is linear. A temperature of 0°C corresponds to 32°F , while a temperature of 100°C corresponds to 212°F . Using this information, and letting C represent temperature measured in Celsius and F temperature measured in degrees Fahrenheit, express F as a function of C .

[4]

Question 7: Sketch the piecewise defined function $f(x) = \begin{cases} 4 - x & \text{if } x < 2 \\ 1 + 2x & \text{if } x \geq 2 \end{cases}$.

[4]

Question 8: What value of k will make the function $f(x)$ continuous if $f(x) = \begin{cases} k - x & \text{if } x < 2 \\ 1 + 2x & \text{if } x \geq 2 \end{cases}$.

[2]

Question 9: Let $f(x) = \sqrt{4x + 1}$ and $g(x) = 1/x$. Find and simplify $(\frac{f}{g})(x)$ and state the domain.

[3]

Question 10: Let $f(x) = 1/x$. Find and simplify $\frac{f(x + h) - f(x)}{h}$.

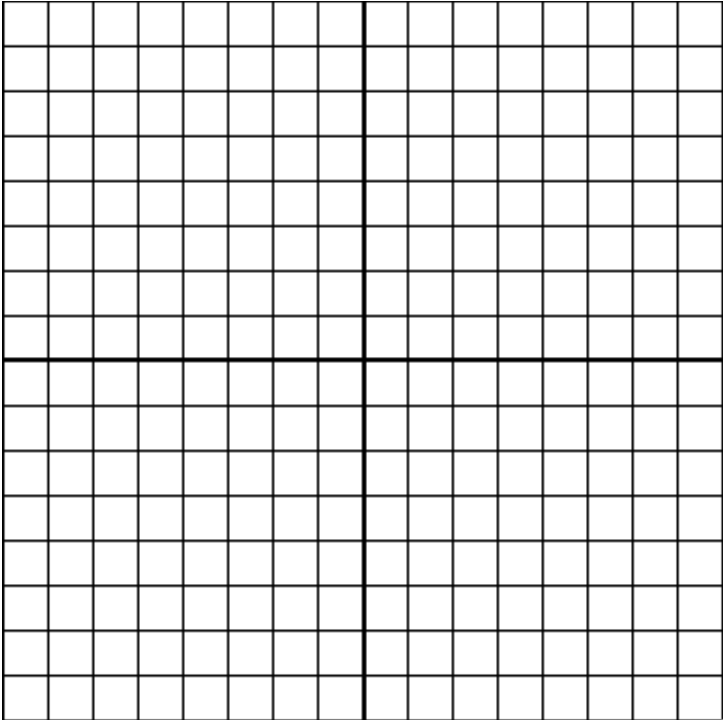
[5]

Question 11: Let $h(x) = \sqrt{6x + 1} - 12$. Find functions f and g such that $(f \circ g)(x) = h(x)$. Do not let $g(x) = x$.

[2]

Question 12: For this question use the function $f(x) = -2x^2 - 12x - 16$.

(i) Graph the function. Draw the x and y axes and indicate the scale on your graph.



[3]

(ii) State the vertex and range of $f(x)$.

[1]

(iii) Find the x -intercepts of the graph, if any.

[2]

Question 13: An object projected upward has height above the ground given by $s(t) = -16t^2 + 64t + 100$ where t represents time in seconds and the height is measured in feet. Determine the maximum height reached by the object.

[4]