Linear Functions

If you are given $f(-3)=5$, then

    a) what is the input?

        -3

    b) what is the output?

        5

    c) what POINT do you know is on the graph of $f(x)$?

        $(-3, 5)$

If $f(-3)=5$ & $f(1)=-11$ answer the following questions:

1) What is the linear function that contains the two values?

$$(-3, 5)$$
$$(1, -11)$$

$$m = \frac{-11-5}{1--3} = \frac{-16}{4} = -4$$

$$y = -4x + b$$
$$-11 = -4(1) + b \qquad \therefore \text{equation is}$$
$$-7 = b \qquad \boxed{y = -4x - 7}$$

2) What is the distance between the two points?

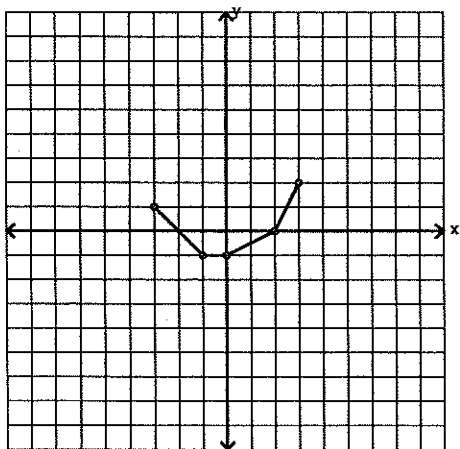$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$= \sqrt{(1--3)^2 + (-11-5)^2}$$
$$= \sqrt{16 + 256} = \sqrt{272} = \boxed{4\sqrt{17}}$$
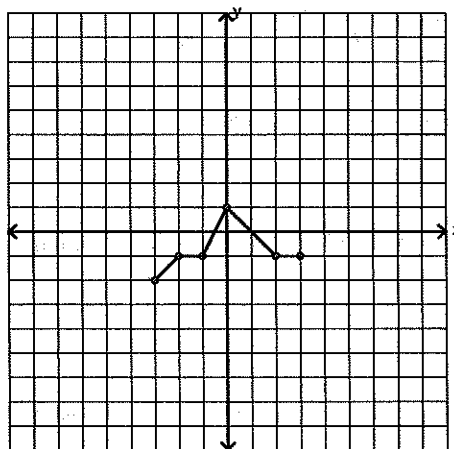
Using graphs to explore operations with functions

Use the graphs of f(x) and g(x) below to answer the questions:

<div style="display:flex">
f(x)　　　　　　　　　　　　　　　　　　g(x)
</div>

Calculate: $(f)(0)$:　-1

Calculate: $(g)(1)$:　0

Calculate: $(f-g)(-3)$:　$f(-3) - g(-3)$

$$= 1 - (-2) = 3$$

Calculate: $(f/g)(2)$:　$\dfrac{f(2)}{g(2)} = \dfrac{0}{-1} = 0$

Calculate: $(f \circ g)(3)$:　$f(g(3)) = f(-1) = -1$

Calculate: $f(f(-2))$:　$f(0) = -1$