

Name Key

For the following problems, use the functions: $f(x) = -2x + 9$, $g(x) = -8.8$, $h(x) = 3x^3 - x - 1$ to find...

1) $f(15)$

$$f(15) = -2(15) + 9$$

$$= -21$$

2) $h(-2)$

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

$$= -23$$

3) $g(0.75)$

$$g(0.75) = -8.8$$

$$= -8.8$$

4) the zero for $f(x)$

$$0 = -2x + 9$$

$$-9 = -2x$$

$$x = 9/2 \text{ or } 4.5$$

5) the zero for $g(x)$

$$0 = -8.8$$

$$0 \neq -8.8$$

No zero

6) the y-int for $h(x)$

$$y = 3(0)^3 - 0 - 1$$

$$= -1$$

7) Assume the table below contains data for a linear function.

a) determine the equation for the function f .

b) find $f(10)$

x	-12	-3	3	6
f(x)	-2	-5	-7	-8

$$a) m = \frac{-8 - (-7)}{6 - 3}$$

$$= \frac{-1}{3}$$

$$f(x) = -\frac{1}{3}x + b$$

$$-7 = -\frac{1}{3}(3) + b$$

$$-7 = -1 + b$$

$$-6 = b$$

$$b) f(10) = -\frac{1}{3}(10) - 6$$

$$= -9\frac{1}{3} \text{ or } -\frac{28}{3}$$

$$f(x) = -\frac{1}{3}x - 6$$

Use the data given to find an equation for g . You may assume g is a linear function.

8) $g(1) = 3$ and $g(3) = 13$

$$m = \frac{13 - 3}{3 - 1} = \frac{10}{2} = 5$$

$$g(x) = 5x + b$$

$$3 = 5(1) + b$$

$$-2 = b$$

$$g(x) = 5x - 2$$

9) $g(-5) = 2$ and $g(-2) = -7$

$$m = \frac{-7 - 2}{-2 - (-5)} = \frac{-9}{3} = -3$$

$$g(x) = -3x + b$$

$$2 = -3(-5) + b$$

$$-13 = b$$

$$g(x) = -3x - 13$$

Simplify the following expressions.

$$\begin{aligned}
 10) \quad & \sqrt{-9} + \sqrt{-49} \\
 & = 3i + 7i \\
 & = 10i
 \end{aligned}$$

$$\begin{aligned}
 11) \quad & \sqrt{-16} \cdot \sqrt{-75} \\
 & = 4i \cdot i \sqrt{25} \sqrt{3} \\
 & = 4i \cdot 5i \sqrt{3} \\
 & = 20i^2 \sqrt{3} \\
 & = -20\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 12) \quad & \sqrt{\frac{12}{121}} \\
 & = \frac{\sqrt{12}}{11} < \frac{\sqrt{4}}{\sqrt{3}} \\
 & = \frac{2\sqrt{3}}{11}
 \end{aligned}$$

$$\begin{aligned}
 13) \quad & \frac{\sqrt{-8}}{\sqrt{-27}} < \frac{\sqrt{4}}{\sqrt{2}} \\
 & < \frac{\sqrt{9}}{\sqrt{3}} \\
 & = \frac{2i\sqrt{2} (\sqrt{3})}{3i\sqrt{3} (\sqrt{3})} \\
 & = \frac{2\sqrt{6}}{9}
 \end{aligned}$$

$$\begin{aligned}
 14) \quad & 5\sqrt{45} - \sqrt{125} \\
 & = 5\sqrt{9}\sqrt{5} - \sqrt{25}\sqrt{5} \\
 & = 5(3)\sqrt{5} - 5\sqrt{5} \\
 & = 15\sqrt{5} - 5\sqrt{5} \\
 & = 10\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 15) \quad & 3(4+2i) - (5-6i) \\
 & = 12+6i-5+6i \\
 & = 7+12i
 \end{aligned}$$

$$\begin{aligned}
 16) \quad & (1-2i)(4+3i) \\
 & = 4+3i-8i-6i^2 \\
 & = 4-5i+6 \\
 & = 10-5i
 \end{aligned}$$

$$\begin{aligned}
 17) \quad & (7-2\sqrt{-3})^2 \\
 & (7-2i\sqrt{3})(7-2i\sqrt{3}) \\
 & = 49-14i\sqrt{3}-14i\sqrt{3}+4i^2\sqrt{9} \\
 & = 49-28i\sqrt{3}-12 \\
 & = 37-28i\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 18) \quad & \frac{2}{1-i\sqrt{7}} \frac{(1+i\sqrt{7})}{(1+i\sqrt{7})} \\
 & = \frac{2+2i\sqrt{7}}{1-i^2\sqrt{49}} \\
 & = \frac{2+2i\sqrt{7}}{8} \\
 & = \frac{1+i\sqrt{7}}{4}
 \end{aligned}$$

$$\begin{aligned}
 19) \quad & \frac{3+4i}{3-4i} \frac{(3+4i)}{(3+4i)} \\
 & = \frac{9+12i+12i+16i^2}{9-16i^2} \\
 & = \frac{9+24i-16}{9+16} \\
 & = \frac{-7+24i}{25}
 \end{aligned}$$

$$\begin{aligned}
 20) \quad & i^7 \\
 & = \frac{1}{i^7} (i) \\
 & = \frac{i}{i^8} \\
 & = \frac{i}{1} = i
 \end{aligned}$$

$$\begin{aligned}
 21) \quad & (i^3)^4 (i^5)^3 \\
 & = i^{12} \cdot i^{15} \\
 & = i^{27} \\
 & = -i
 \end{aligned}$$

Do you know your



chart?

$$\begin{aligned}
 \sqrt{-1} & = i \\
 i^2 & = -1 \\
 i^3 & = -i \\
 i^4 & = 1
 \end{aligned}$$