

Simplify.

1.  $(3 - 4i)(-2 - 3i)$

$$-18 - 1i$$

2.  $i^{91}$

$$-1i$$

3.  $3i(2i^2 - 6i)$

$$-6i + 18$$

4.  $\frac{6x-17}{x^2-5x+6} - \frac{5}{x-2}$

$$\frac{1}{(x-3)}$$

$$x \neq 3, 2$$

5.  $\frac{9x^2-16}{12x+16} * \frac{14x-28}{x^2+10x-24}$

$$\frac{7(3x-4)}{2(x+12)}$$

$$x \neq -\frac{4}{3}, -12, 2$$

Solve.

6.  $9x^2 + 9x - 4 = 0$

$$x = \frac{1}{3} \quad x = -\frac{4}{3}$$

7.  $\sqrt{x} + 4 = \sqrt{x+32}$

$$x = 4$$

8.  $6 - 2\sqrt{5x+1} = -12$

$$x = 16$$

Divide.

9.  $(12x^4 - 8x^3 + 7x^2 - 10x + 5) \div (4x^2 - 3)$

$$3x^2 - 2x + 4 + \frac{-16x + 17}{4x^2 - 3}$$

Find all zeroes.

10.  $f(x) = x^4 - 16x^3 + 97x^2 - 254x + 232$

$$x = 2$$

$$x = 4$$

$$x = \frac{10 \pm 4i}{2} \text{ or } 5 \pm 2i$$

11. Given the following functions:  $a(x) = \frac{x-3}{4}$

$$b(x) = \frac{1}{5}x - 2$$

$$c(x) = 4x + 3$$

a. Find  $c(b(-10))$

$$-13$$

b. Find  $b^{-1}(x)$

$$b^{-1}(x) = 5x + 10$$

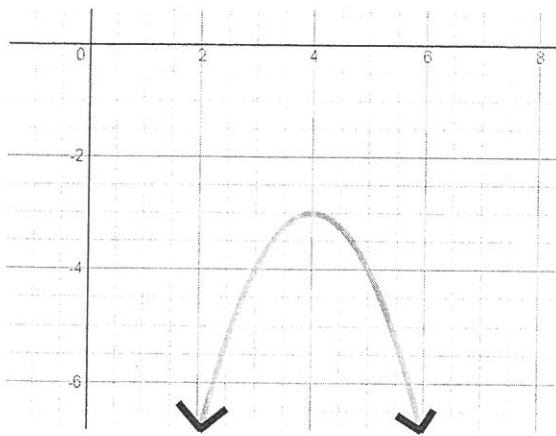
c. Prove that  $a(x)$  and  $c(x)$  are inverses using compositions

$$a(c(x)) = x$$

$$c(a(x)) = x$$

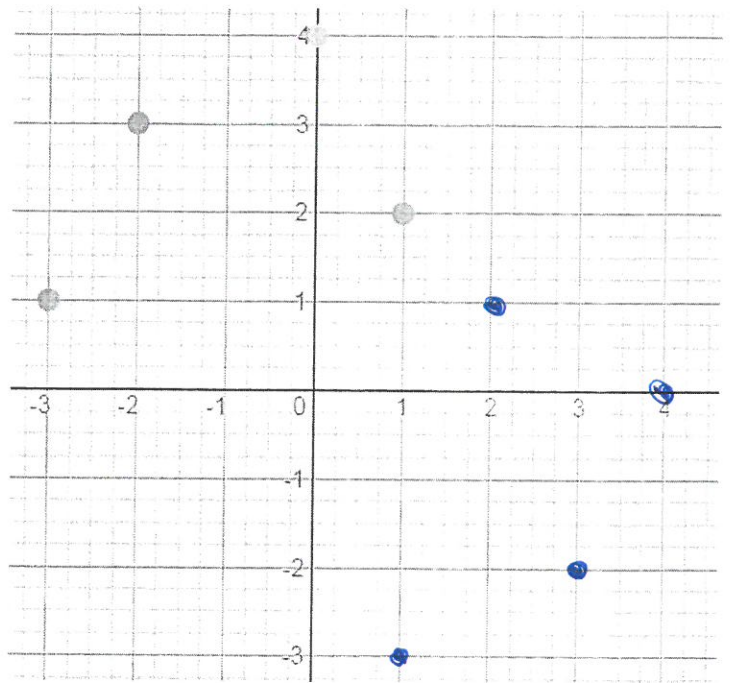
12. Given the following graphs, name the following:

a.



Domain:  $(-\infty, \infty)$   
 Range:  $(-\infty, -3]$   
 Function (Y or N): Yes

b.



Domain:  $\{-3, -2, 0, 1\}$  Sketch the inverse.  
 Range:  $\{1, 2, 3, 4\}$  Domain:  $\{1, 2, 3, 4\}$   
 Function (Y or N): Yes Range:  $\{-3, -2, 0, 1\}$   
 Function (Y or N): Yes

