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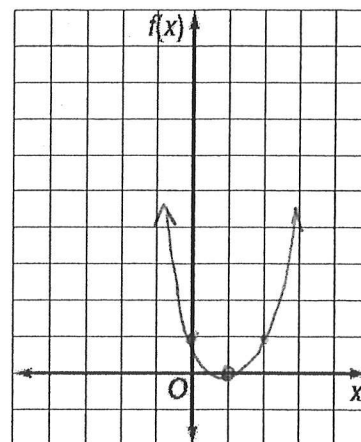
**Station 1 – Section 5.1:** Graphing Quadratic Functions

- For the following quadratic function, find:
  - y-intercept 1
  - Equation of the axis of symmetry  $x = 1$
  - Vertex  $(1, 0)$
  - Graph the function.

$$f(x) = x^2 - 2x + 1$$

$$= (x-1)^2$$

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



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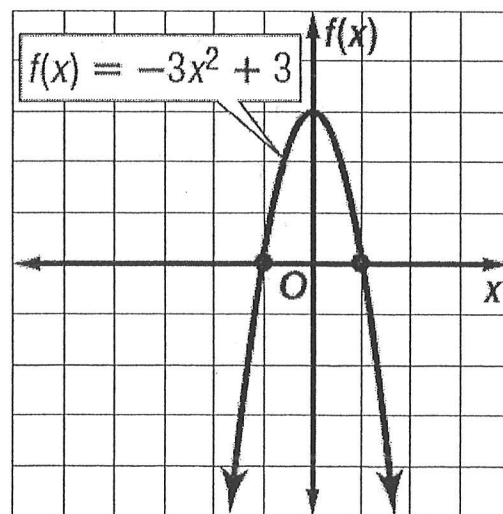
**Station 2 – Section 5.1 and 5.2:** Graphing Quadratic Functions and Determine the Solutions

- For the following quadratic function, determine:
  - Whether it is concave up or down
  - Has a maximum or minimum
  - Domain and Range
  - The solutions

Concave Down

Max

D: All Reals

R:  $y \leq 3$ Roots:  $-1, 1$ 

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**Station 3 – Section 5.3:** Solving Quadratic Equations by Factoring

For #1 and 2, solve each by factoring.

1)  $x^2 = 144$

$x^2 - 144 = 0$

$(x+12)(x-12) = 0$

$x = -12, x = 12$

2)  $3x^2 + 2x - 21 = 0$

$(3x-7)(x+3) = 0$

$x = 7/3, x = -3$

3) Write a quadratic equation that has 3 and -4 as roots. Write the equation in standard form.

$(x-3)(x+4) = 0$

$x^2 + 4x - 3x - 12 = 0$

$x^2 + x - 12 = 0$

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**Station 4 – Section 5.3:** Solving Quadratic Equations by Factoring

For #4 and 5, solve each by factoring.

4)  $12x^2 - 8x = 0$

$4x(3x-2) = 0$

$4x = 0 \quad 3x - 2 = 0$

$x = 0 \quad x = 2/3$

5)  $x^2 + x - 30 = 0$

$(x+6)(x-5) = 0$

$x = -6, x = 5$

6) Write a quadratic equation that has 3 and  $\frac{2}{5}$  as roots. Write the equation in standard form.

$(x-3)(5x-2) = 0$

$5x^2 - 2x - 15x + 6 = 0$

$5x^2 - 17x + 6 = 0$

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**Station 5 – Section 5.4: Complex Numbers**

For #7-10, simplify the following.

$$7) \frac{\sqrt{99}}{\sqrt{9 \cdot 11}}$$

$$3\sqrt{11}$$

$$8) \sqrt{\frac{27}{49}} = \frac{\sqrt{9 \cdot 3}}{\sqrt{49}} = \frac{3\sqrt{3}}{7}$$

$$9) \frac{\sqrt{52x^3y^5}}{\sqrt{4 \cdot 13x^2xy^4}}$$

$$2xy^2\sqrt{13xy}$$

$$10) \sqrt{-81x^6}$$

$$9x^3i$$

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**Station 6 – Section 5.4: Complex Numbers**

For #11-14, simplify the following.

$$11) \sqrt{-23} \cdot \sqrt{-46}$$

$$i\sqrt{23} \cdot i\sqrt{23 \cdot 2}$$

$$23i^2\sqrt{2}$$

$$\boxed{-23\sqrt{2}}$$

$$12) (3i)(-2i)(5i)$$

$$-30i^3$$

$$-30(-i)$$

$$\boxed{30i}$$

$$13) i^{11}$$

$$(i^2)^5 i$$

$$(-1)^5 i$$

$$\boxed{-i}$$

$$14) (7 - 8i) + (-12 - 4i)$$

$$\underline{7 - 8i} + \underline{-12 - 4i}$$

$$\boxed{-5 - 12i}$$

$$15) (10 - 4i) - (7 + 3i)$$

$$\underline{10 - 4i} - \underline{7 + 3i}$$

$$\boxed{3 - 7i}$$

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**Station 7 – Section 5.4: Complex Numbers**

For #16-19, simplify the following.

16)  $(7 - 6i)(2 - 3i)$

$14 - 21i - 12i + 18i^2$

$14 - 33i + 18(-1)$

$14 - 33i - 18$

$\boxed{-4 - 33i}$

17)  $(3 + 4i)(3 - 4i)$

$9 - 12i + 12i - 16i^2$

$9 - 16(-1)$

$9 + 16$

$\boxed{25}$

18)  $\frac{8-6i}{3i} \cdot \frac{i}{i}$

$\frac{8i - 6i^2}{3i^2}$

$3i^2$

$8i - 6(-1)$

$3(-1)$

$\boxed{\frac{6+8i}{-3}}$

19)  $\frac{3i}{4+2i} \cdot \frac{4-2i}{4-2i}$

$\frac{12i - 6i^2}{16 - 8i + 8i - 4i^2}$

$16 - 8i + 8i - 4i^2$

$\frac{12i - 6(-1)}{16 - 4(-1)} = \frac{12i + 6}{16 + 4} = \frac{6 + 12i}{20}$

$= \boxed{\frac{3+6i}{10}}$

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**Station 8 – Section 5.4: Complex Numbers**

For #20-24, solve each equation.

20)  $3x^2 + 3 = 0$

$3x^2 = -3$

$\sqrt{x^2} = \sqrt{-1}$

$\boxed{x = \pm i}$

21)  $-x^2 - 16 = 0$

$-x^2 = 16$

$\sqrt{x^2} = \sqrt{-16}$

$\boxed{x = \pm 4i}$

22)  $x^2 + 18 = 0$

$\sqrt{x^2} = \sqrt{-18}$

$x = \pm i\sqrt{9 \cdot 2}$

$\boxed{x = \pm 3i\sqrt{2}}$

For #23 and 24, find the values of  $m$  and  $n$  that make each equation true.

23)  $20 - 12i = 5m + 4ni$

$20 = 5m$

$-12 = 4n$

$\boxed{m=4}$

$\boxed{n=-3}$

24)  $(4 + m) + 2ni = 9 + 14i$

$4 + m = 9$

$2n = 14$

$\boxed{m=5}$

$\boxed{n=7}$