# Pick up a bell ringer and hw tracker

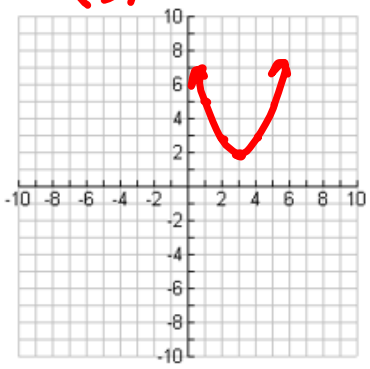
**Monday 11/5**

Graph the following functions and describe the transformations from the parent functions.

1. $f(x) = (x-3)^2 + 2$

Transformations:

(3,2) → 3 ↑ 2



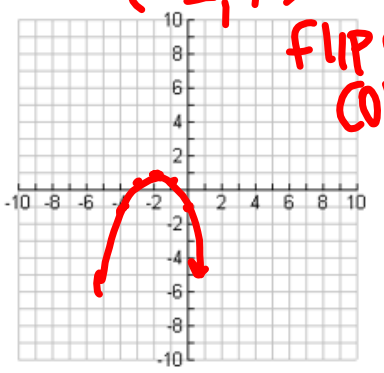

2. $f(x) = -\frac{1}{2}(x+2)^2 + 1$

Transformations:

(-2, 1) ← 2 ↑ 1

flip down

Compression



$\sqrt{16} = 4$

$\sqrt{40} =$

$\sqrt{4} \cdot \sqrt{10}$

$= 2\sqrt{10}$

$\sqrt{40} = 2\sqrt{10}$

$4 \cdot 10$

$2 \cdot 2$

$\sqrt{-16} =$

$\sqrt{-40} =$

$i^2 = -1$

$i = \sqrt{-1}$

$i \cdot i = i^2 = -1$

$\sqrt{-16} =$

$\sqrt{16} \cdot \sqrt{-1}$

$4i$

$\sqrt{-40} =$

$\sqrt{4} \cdot \sqrt{10} \cdot \sqrt{-1}$

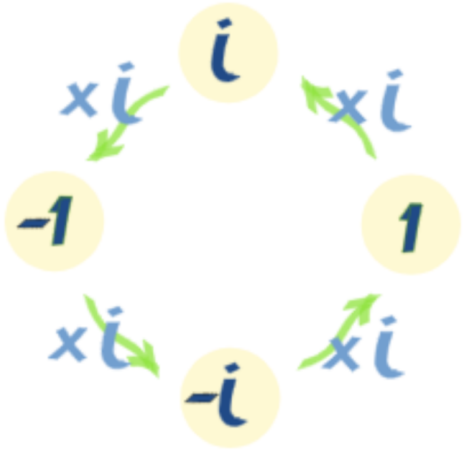
$2i\sqrt{10}$

$1 \times i = i$

$i \times i = i^2 = -1$

$-1 \times i = -i$

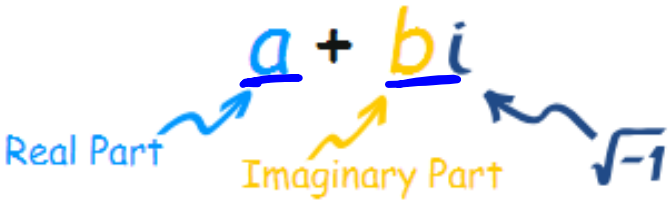
$-i \times i = -i^2 = -(-1) = 1$



## Examples of Imaginary Numbers

| | | | | | |
|---|---|---|---|---|---|
| $i$ | $12.38i$ | $-i$ | $3i/4$ | $0.01i$ | $-i/2$ |

Complex numbers...



| Real #s | Imaginary #s | Complex #s |
|---|---|---|
| $2$ | $i$ | $2+i$ |
| $-10$ | $2i$ | $-10+2i$ |
| $\frac{3}{4}$ | $\frac{2i}{5}$ | $a+bi$ |
| $.168$ | $.37i$ | $5+20i$ |
| $\pi$ | | $\infty+\infty i$ |
| $\sqrt{2}$ | | $\underline{6}-\underline{10i}$ |

Name: _____Hr:_____ **Complex Numbers**

Express each number in terms of *i*, and simplify.

1. $\sqrt{-36}$ = 6i
$\sqrt{36}\cdot\sqrt{-1}$

2. $\sqrt{-100}$
$i\sqrt{100}$
$10i$

3. $-\sqrt{-81}$ = $-9i$
$\sqrt{81}\cdot\sqrt{-1}$

4. $2\sqrt{-49}$

5. $-2\sqrt{-3}$
$-2i\sqrt{3}$ $\sqrt{3}\cdot\sqrt{-1}$

6. $3\sqrt{-11}$

7. $\sqrt{-\frac{1}{4}}$ = $\frac{i}{2}$
$\frac{\sqrt{1}}{\sqrt{4}} = \frac{1i}{2}$

8. $\sqrt{-\frac{16}{25}}$

9. $\sqrt{-20}$ $2i\sqrt{5}$
$2\cdot 2\cdot 5$

10. $\sqrt{-28}$
$\sqrt{28} = 2i\sqrt{7}$
$2\cdot 2\cdot 7$

11. $-\sqrt{-10}$

12. $2\sqrt{-75}$

13. $5\sqrt{-8}$

Write each number in terms of *i*, perform the indicated operation, and write the answer in the form a+bi.

14. $\sqrt{-64}+\sqrt{-36}$
$\sqrt{-1}\cdot\sqrt{64}$
$8i+6i$
$=14i$

15. $3\sqrt{-4}+\sqrt{-121}$

16. $\sqrt{-100}-\sqrt{-9}$

**Simplify the following complex numbers. Write your answer in the form a+bi.**

17. $(2-7i)+(-5-2i)$
$2-7i-5-2i$
$-3-9i$

18. $(-4+5i)+(-3+i)$

19. $(-2+4i)-(6-3i)$
$-2+4i-6+3i$
$-8+7i$

20. $(2-i)-(-5+8i)$
$2-i+5-8i$
$7-9i$

21. $(-4-3i)+(9-3i)$

22. $(-2-7i)-(-5-9i)$

23. $(4i)(7i)$

24. $(8i)(7+5i)$

25. $(-5i)(3-7i)$

26. $(-3i+1)(4+3i)$

27. $(-7+4i)(1-2i)$

28. $(5-3i)^2$

29. $(4+3i)^2$

**Factor.**

30. $x^2+25$

31. $9x^2+4$

32. $2x^2+32$

33. $3x^2+108$

**Solve.**

34. $a^2=-9$

35. $\frac{x^2}{36}=-1$

36. $x^2+36=117$

37. $0=64-4k^2$

38. $9p^2=12p-11$

39. $3a^2+9=7a$

40. $2=-2x^2$

41. $4k^2+3=-4k$

$(a^2+9)$ $(4x^2+25)$ $(9x^2+100)$

$(a+3i)(a-3i)$ $(2x+5i)(2x-5i)$ $(3x+10i)(3x-10i)$

$a^2 \cancel{-3i+3i} - 9i^2$

$-9(-1)$

$=+9$

$a^2+9$

$6i^2 = -6$

$6(-1)$

$-10i^2 = 10$

$-10(-1)$

$3i^2 = -3$

$-16i^2 = 16$

Complex Numbers ws due Friday