8.) $\frac{\sqrt{5}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{10}}{2}$

10.) $\frac{\sqrt{2}}{(2+\sqrt{3})} \cdot \frac{(2-\sqrt{3})}{(2-\sqrt{3})} = \frac{2\sqrt{2}-\sqrt{6}}{4-3}$

FOIL

$= 2\sqrt{2}-\sqrt{6}$

6.) $\dfrac{\sqrt{15}}{\sqrt{48}} = \dfrac{\sqrt{5}}{\sqrt{16}} = \dfrac{\sqrt{5}}{4}$

9.) $\dfrac{6}{5\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}} = \dfrac{6\sqrt{3}}{15} = \dfrac{2\sqrt{3}}{5}$

$5 \cdot 3$

15) 3 and 4

$f(x) = (x - 3)(x - 4)$

$f(x) = x^2 - 7x + 12$

53.) $x^2 - 6 = x$

$ax^2 + bx + c = 0$

$x^2 - x - 6 = 0$

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

Solve: $\boxed{x = 3, -2}$

61.) $lw = A$

$(x+16)x = 80$

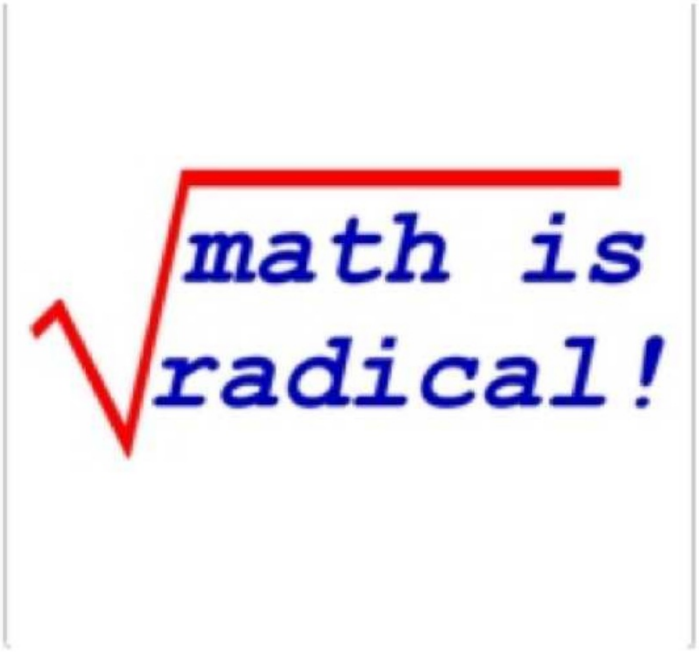
$x^2 + 16x - 80 = 0$

$(x+20)(x-4) = 0$

$x = \cancel{-20}, 4$

$\boxed{4 \text{ ft}; 20 \text{ ft}}$

Complex Numbers



REVIEW

ex: Simplify.

a) $-\sqrt{121} = -11$

b) $\sqrt{75} = \sqrt{25}\sqrt{3} = 5\sqrt{3}$

REVIEW

ex: Simplify.

c) $6\sqrt{45}$

$\underbrace{6\sqrt{9}}\sqrt{5}$

$18\sqrt{5}$

d) $\sqrt{0.25} = \sqrt{\frac{1}{4}} = \frac{1}{2}$

REVIEW

ex: Simplify.

e) $\sqrt{-9}$

not real

f) $\sqrt{\frac{3}{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{15}}{5}$

REVIEW

ex: Simplify.

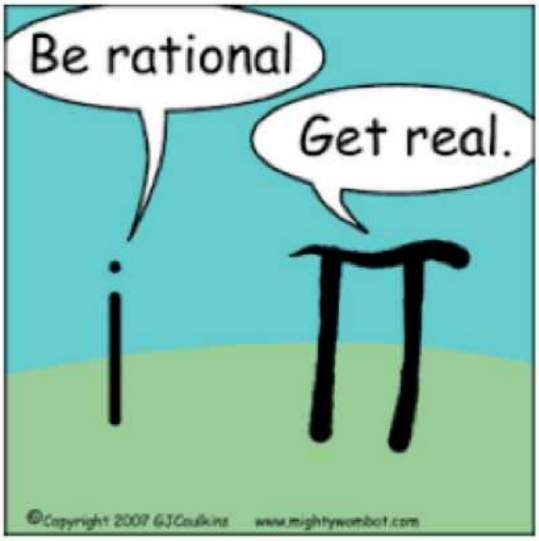
g) $\frac{5}{3-\sqrt{2}} \cdot \frac{(3+\sqrt{2})}{(3+\sqrt{2})}$

$\frac{15+5\sqrt{2}}{9-2}$

$\frac{15+5\sqrt{2}}{7}$

Imaginary Numbers

$$\boxed{\sqrt{-1} = \underline{\quad i \quad}}$$



ex: Simplify.

a) $\sqrt{-9}$

$\sqrt{-1}\sqrt{9}$

$3i$

$7x$

$x7$

b) $\sqrt{-18}$

$i\sqrt{18}$

$i\sqrt{2}\sqrt{9} = 3i\sqrt{2}$

c) $\sqrt{-32}$

$i\sqrt{16}\cdot\sqrt{2}$

$4i\sqrt{2}$

$i\sqrt{8}\sqrt{4}$

$2i\sqrt{8}$

$2i\sqrt{2}\,\underline{\underline{\sqrt{4}}}$

$4i\sqrt{2}$

d) $2\sqrt{-45}$

$2i\sqrt{9}\sqrt{5}$

$6i\sqrt{5}$

Complex Numbers

Standard Form: $a+bi$

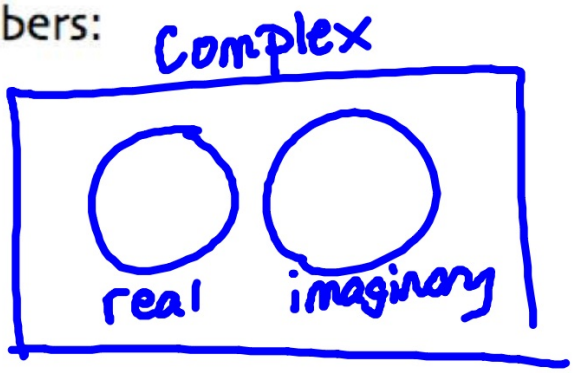
a: real b: imaginary

Examples of Complex Numbers:

$5 = 5+0i$

$2+3i$

$7i = 0+7i$



*EVERY NUMBER CAN BE EXPRESSED AS A COMPLEX NUMBER!

ex: Simplify. Express the answer in standard form.

$a+bi$

a) $(3+6i)+(6-42i)$

$9-36i$

b) $(6-42i)-(3-64i)$

$6-42i-3+64i$

$3+22i$

c) $7(3-2i)$

$21-14i$

$\sqrt{-1}=i$

$i^2=-1$

d) $7i(3-2i)$

$21i-14i^2$

$21i+14$

$14+21i$

dd.) $3i(4-5i)$

$12i-15i^2$

$15+12i$

e) $(1+2i)(3-5i)$

$3 - \underline{5i} + \underline{6i} - 10i^2$

$3 + i + 10$

$13 + i$

f) $(6-3i)(6+3i)$

$36 + \cancel{18i} - \cancel{18i} - \underline{9i^2}$

45

g) $(1-2i)^2 = (1-2i)(1-2i)$

$i^2 = -1$

$1 - 2i - 2i + 4i^2$

$1 - 4i - 4$

$-3 - 4i$

h) $\frac{6}{i} \cdot \frac{i}{i}$

$\frac{6i}{-1} = -6i$

i) $\frac{2}{3i} \cdot \frac{i}{i} = \frac{2i}{3i^2} = \frac{2i}{-3}$ or $-\frac{2i}{3}$

j) $\frac{5}{2+i} \cdot \frac{(2-i)}{(2-i)} = \frac{10-5i}{4-i^2} = \frac{10-5i}{5}$

$= \frac{10}{5} - \frac{5i}{5} = 2 - i$

k) $\frac{2i}{3-i} \frac{(3+i)}{(3+i)}$

$a+bi$

$i^2=-1$

$$\frac{6i+2i^2}{9-i^2}$$

$$\frac{6i-2}{10} = \frac{-2}{10}+\frac{6i}{10} = \frac{-1}{5}+\frac{2}{5}i$$

D) $\dfrac{5+2i}{3-2i}$

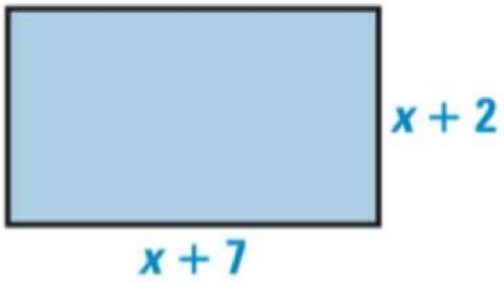
$\dfrac{11}{13} + \dfrac{16i}{13}$ or $\dfrac{11}{13} + \dfrac{16}{13}i$

Review

ex: Find the roots.

$$8x^2 - 54x = 15$$

Review

ex: Find x.

Area of rectangle = 84