

Solutions

Lesson 13 Practice Problems

1. Which expression is equivalent to $2i(5 + 3i)$? $= -6 + 10i$

A. $-6 + 10i$

B. $6 + 10i$

C. $-10 + 6i$

D. $10 + 6i$

2. Lin says, "When you add or multiply two complex numbers, you will always get an answer you can write in $a + bi$ form."

Noah says, "I don't think so. Here are some exceptions I found:"

$$(7 + 2i) + (3 - 2i) = 10$$

$$(2 + 2i)(2 + 2i) = 8i$$

a. Check Noah's arithmetic. Is it correct?

yes

b. Can Noah's answers be written in the form $a + bi$, where a and b are real numbers? Explain or show your reasoning.

$$10 = 10 + 0i$$

$$8i = 0 + 8i$$

3. Explain to someone who missed class how you would write $(3 - 5i)(-2 + 4i)$ in the form $a + bi$, where a and b are real numbers.

Distribute: $(3 - 5i)(-2 + 4i) = -6 + 12i + 10i - 20i^2$

collect like terms $= 14 + 22i$

$i^2 = -1$

4. Which expression is equal to $729^{\frac{2}{3}}$?

$$= \left(\sqrt[3]{729} \right)^2 = 9^2 = 81$$

A. 243

B. 486

C. 9^2

D. 27^3

(From Unit 3, Lesson 4.)

5. Find the solution(s) to each equation, or explain why there is no solution.

a. $2x^2 - \frac{2}{3} = 5\frac{1}{3}$

$$x = \pm \sqrt{3}$$

$$2x^2 = 6$$

$$x^2 = 3$$

b. $(x + 1)^2 = 81$

$$x + 1 = \pm 9$$

$$x = 8, -10$$

c. $3x^2 + 14 = 12$

$$3x^2 = -2$$

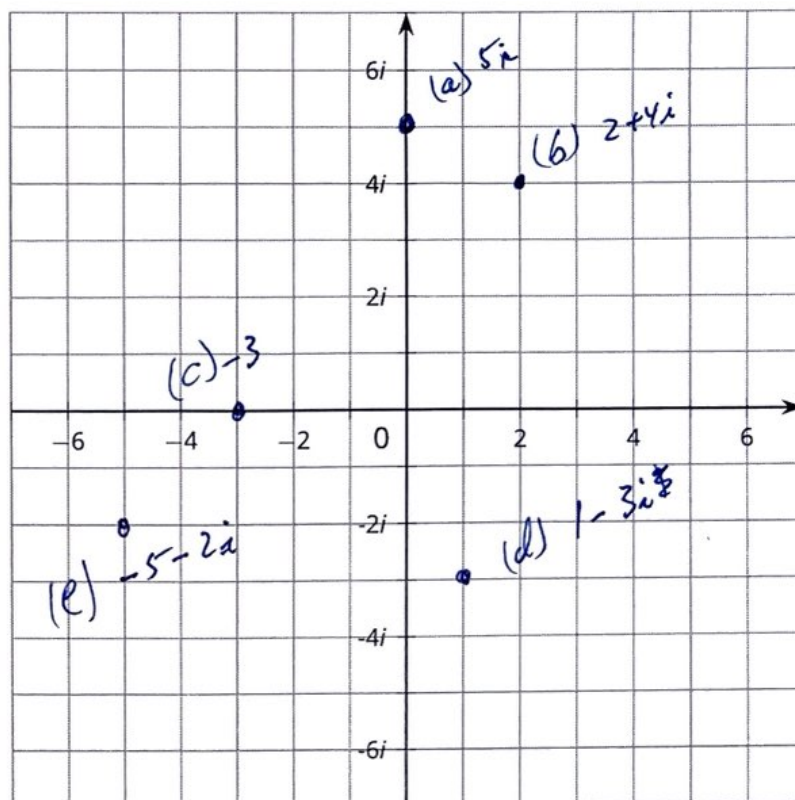
$$x^2 = -\frac{2}{3}$$

No real solutions
squares of real numbers
are always non-negative

(From Unit 3, Lesson 7.)

6. Plot each number in the complex plane.

- a. $5i$
- b. $2 + 4i$
- c. -3
- d. $1 - 3i$
- e. $-5 - 2i$



(From Unit 3, Lesson 11.)

7. Select **all** the expressions that are equivalent to $(3x + 2)(x - 4)$ for all real values of x .

A. $3x^2 - 12$

☒ B. $3x^2 - 10x - 8$

C. $3(x^2 + 2x - 4)$

☒ D. $3(x^2 - 3x) - (x + 8) = 3x^2 - 9x - x - 8$

E. $3x(x - 3) - 2(5x + 4) = 3x^2 - 9x - 10x - 8$

☒ F. $3x(x - 4) + 2(x - 4) = 3x^2 - 12x + 2x - 8$

(From Unit 2, Lesson 23.)