Name: _____

A2.N.9: Multiplication and Division of Complex Numbers 2: Perform arithmetic operations on complex numbers and write the answer in the form a+bi

1 The product of $5 - 2i$ and i is

2 The product of $(2 - 2i)$ and $(2 + 2i)$ is

3 When $-3 - 2i$ is multiplied by its conjugate, the result is

4 The product of $(3 - 2i)$ and $(7 + 6i)$ is

5 The product of $(-2 + 6i)$ and $(3 + 4i)$ is

6 What is the product of the complex numbers $2 + 3i$ and $1 - 2i$ expressed in simplest terms?

7 The expression $(i^3 - 1)(i^3 + 1)$ is equivalent to

8 If $x = 3i$, $y = 2i$, and $z = m + i$, the expression xy^2z equals

9 The expression $(1 + i)^2$ is equivalent to

10 The value of $(1 - i)^2$ is

11 The expression $(2 + i)^2$ is equivalent to

12 The expression $(3 - i)^2$ is equivalent to

13 The expression $(3 - 7i)^2$ is equivalent to

14 Expressed in $a + bi$ form, $(1 + 3i)^2$ is equivalent to

15 The expression $(2 + 3i)^2$ is equal to

16 If $f(x) = x^2$, then $f(2 - 3i)$ equals

Name: _____

17 The expression $(-1+i)^3$ is equivalent to

18 The expression $(x+i)^2-(x-i)^2$ is equivalent to

19 The expression $\frac{1}{2-i}$ is equivalent to

20 Expressed in $a+bi$ form, $\frac{5}{3+i}$ is equivalent to

21 The expression $\frac{10}{3+i}$ is equivalent to

22 The expression $\frac{1}{5+2i}$ is equivalent to

23 The expression $\frac{3}{2+3i}$ is equivalent to

24 The expression $\frac{5}{4+3i}$ is equivalent to

25 The expression $\frac{2+i}{3+i}$ is equivalent to

26 What is the multiplicative inverse of $3i$?

27 What is the multiplicative inverse of $3-i$?

28 The relationship between voltage, *E*, current, *I*, and resistance, *Z*, is given by the equation $E = IZ$. If a circuit has a current $I = 3+2i$ and a resistance $Z = 2-i$, what is the voltage of this circuit?

29 Impedance measures the opposition of an electrical circuit to the flow of electricity. The total impedance in a particular circuit is given by the formula $Z_T = \frac{Z_1 Z_2}{Z_1 + Z_2}$. What is the total impedance of a circuit, Z_T, if $Z_1 = 1+2i$ and $Z_2 = 1-2i$?

30 What is the product of $5+\sqrt{-36}$ and $1-\sqrt{-49}$, expressed in simplest $a+bi$ form?

A2.N.9: Multiplication and Division of Complex Numbers 2: Perform arithmetic operations on complex numbers and write the answer in the form a+bi
Answer Section

1 ANS:
$2 + 5i$

REF: 089726siii

2 ANS:
8

REF: 068022siii

3 ANS:
13
$(-3 - 2i)(-3 + 2i) = 9 - 4i^2 = 9 + 4 = 13$

REF: 011512a2

4 ANS:
$33 + 4i$

REF: 019035siii

5 ANS:
$-30 + 10i$

REF: 069620siii

6 ANS:
$8 - i$

REF: 080322siii

7 ANS:
-2

REF: 010235siii

8 ANS:
$12 - 12mi$
$(3i)(2i)^2(m + i)$

$(3i)(4i^2)(m + i)$

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

$(-12i)(m + i)$

$-12mi - 12i^2$

$-12mi + 12$

REF: 061319a2

9 ANS:
$2i$

REF: 089519siii

10 ANS:
$-2i$

REF: 019932siii

11 ANS:
$3+4i$

REF: 018421siii

12 ANS:
$8-6i$

REF: 019622siii

13 ANS:
$-40-42i$

REF: fall0901a2

14 ANS:
$-8+6i$

REF: 069719siii

15 ANS:
$-5+12i$

REF: 018923siii

16 ANS:
$-5-12i$

REF: 088923siii

17 ANS:
$2+2i$

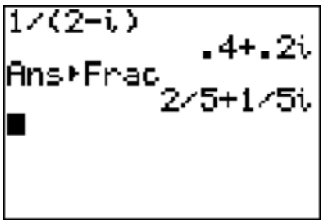
REF: 010219b

18 ANS:
$4xi$
$(x+i)^2-(x-i)^2=x^2+2xi+i^2-(x^2-2xi+i^2)=4xi$

REF: 011327a2

19 ANS:
$\frac{2+i}{5}$

$\frac{1}{2-i} \cdot \frac{2+i}{2+i} = \frac{2+i}{4-i^2} = \frac{2+i}{5}.$



REF: 061014b
20 ANS:
$\frac{3}{2} - \frac{1}{2}i$

REF: 069722siii
21 ANS:
$3 - i$

REF: 010811b
22 ANS:
$\frac{5-2i}{29}$

REF: 019522siii
23 ANS:
$\frac{6-9i}{13}$

REF: 019414siii
24 ANS:
$\frac{4-3i}{5}$

REF: 010128siii
25 ANS:
$\frac{7+i}{10}$

REF: 060513b
26 ANS:
$-\frac{i}{3}$

REF: 060614b

27 ANS:
$\frac{3+i}{10}$

REF: 068521siii

28 ANS:
$8+i$

REF: 060304b

29 ANS:
$\frac{5}{2}$

REF: 060509b

30 ANS:
$47-29i$
$(5+\sqrt{-36})(1-\sqrt{-49}) = (5+6i)(1-7i) = 5-35i+6i-42i^2 = 5-29i-42(-1) = 47-29i$

REF: 080314b