

Unit 1 test review

Simplify.

1) $\sqrt{-196}$

$14i$

2) $\sqrt{-28}$

$2i\sqrt{7}$

3) $\sqrt{-45}$

$3i\sqrt{5}$

4) $\sqrt{-27}$

$3i\sqrt{3}$

5) $-\sqrt{-245}$

$-7i\sqrt{5}$

6) $-2\sqrt{-180}$

$-12i\sqrt{5}$

7) $-3\sqrt{-150}$

$-15i\sqrt{6}$

8) $-4\sqrt{-80}$

$-16i\sqrt{5}$

9) $(-8i) + (6i)$

$-2i$

10) $(-6i) - (8i)$

$-14i$

11) $(6 + 8i) - (3i)$

$6 + 5i$

12) $(-i) + (6i)$

$5i$

13) $(-7 + 6i) + (-5 - 6i)$

-12

14) $(-i) - 3 - (-1 - i)$

-2

$-i - 3 + 1 + i$

15) $(2 + 3i) + (5 + 7i)$

$7 + 10i$

16) $(-4 + 2i) - (8 - 3i)$

$-12 + 5i$

17) $(8 - 4i) - (1 + 2i) + (-6 + 6i)$

1

18) $-2 + (1 - 5i) - (7 + 7i)$

$-8 - 12i$

19) $(-4 - 3i) - 6 - (5 + 7i)$

$-15 - 10i$

20) $(5 + 3i) - (2 - 3i) + (-1 - 7i)$

$2 - i$

21) $7(8 - 3i)$

$56 - 21i$

22) $(4i)(4i)$

$16i^2 = -16$

23) $8(-3i)$

$-24i$

24) $8(3i)$

$24i$

25) $(-4 - 6i)(-8 - 4i)$

$= 8 + 64i$

$+32 + 16i + 48i + 24i^2$

26) $(-3 + 5i)^2$

$= -16 - 30i$

$9 - 15i - 15i + 25i^2$

27) $(-4i)(8i)(7 + i)$

$-32i^2(7 + i)$

$32(7 + i) = 224 + 32i$

28) $(-4 - i)(-3 - 7i)$

$12 + 28i + 3i + 7i^2$

$= 5 + 31i$

$$29) (-2+2i) - (8i) \quad -2-6i$$

$$30) -8 + (-8-2i) \quad -16-2i$$

$$31) (-3i) - (3i) \quad -6i$$

$$32) -8 - (2i)(-4i) \\ -8 - -8i^2 = -8 - 8 = -16$$

$$33) (5+i)^2 \quad = 24+10i \\ 25+5i+5i+i^2$$

$$34) (-8-3i)(-2+3i) \quad = 16+9-18i \\ 16-24i+6i-9i^2 \quad 25-18i$$

$$35) (-1+i) - 5 - (6i) \\ -6-5i$$

$$36) 7(-5+i) - (5i)(3+2i) \\ -35+7i-15i-10i^2 = -25-8i$$

$$37) \frac{5}{-10-8i} \cdot \frac{-10+8i}{-10+8i} = \frac{-50+40i}{164}$$

$$38) \frac{10-2i}{-1+2i} \cdot \frac{-1-2i}{-1-2i} = \frac{-10-20i+2i+4i^2}{5} = \frac{-14-18i}{5}$$

$$39) \frac{i}{-10+3i} \cdot \frac{-10-3i}{-10-3i} = \frac{-10i-3i^2}{100+9} = \frac{-10i+3}{109}$$

$$40) \frac{8i}{6+4i} \cdot \frac{6-4i}{6-4i} = \frac{48i-32i^2}{36+16} = \frac{32+48i}{52} = \frac{8+12i}{13}$$

$$41) \frac{6-6i}{-3+5i} \cdot \frac{-3-5i}{-3-5i} = \frac{-18-30i+18i+30i^2}{9+25} \\ = \frac{-48-12i}{34} = \frac{-24-6i}{17}$$

$$42) \frac{-4+2i}{7-10i} \cdot \frac{7+10i}{7+10i} = \frac{-28-40i+14i+20i^2}{49+100} \\ = \frac{-48-26i}{149}$$

$$43) -\frac{1}{i} \cdot \frac{-i}{-i} = \frac{i}{-i^2} = \frac{i}{+1} = +i$$

$$44) \frac{4}{-2+9i} \cdot \frac{-2-9i}{-2-9i} = \frac{-8-36i}{4+81} = \frac{-8-36i}{85}$$

$$45) \frac{3-6i}{3+2i} \cdot \frac{3-2i}{3-2i} = \frac{9-6i-18i+12i^2}{9+4} \\ = \frac{-3-24i}{13}$$

$$46) \frac{-3-2i}{5i} \cdot \frac{-5i}{-5i} = \frac{15i+10i^2}{25} = \frac{-10+15i}{25} \\ = \frac{-2+3i}{5}$$

Simplify

$$47) i^{99} = -i$$

$$48) i^{233} = i \text{ or } \sqrt{-1}$$

$$49) i^{38} = -1$$

$$50) i^{1000} = 1$$

$$51) 3i^2 - 4i^3 \\ = -3 + 4i$$

$$52) i^{25} + i^{33} \\ i^0 + i^0 = 2i^0 = 2$$