

## TEST REVIEW solutions

Simplify the expression.

1.  $\sqrt{525} = \sqrt{25 \cdot 21} = \boxed{5\sqrt{21}}$

2.  $\sqrt{567} = \sqrt{81 \cdot 7} = \boxed{9\sqrt{7}}$

3.  $\sqrt{192} = \sqrt{64 \cdot 3} = \boxed{8\sqrt{3}}$

4.  $\sqrt{\frac{49}{81}} = \boxed{\frac{7}{9}}$

5.  $\sqrt{\frac{128}{25}} = \frac{\sqrt{64 \cdot 2}}{5} = \boxed{\frac{8\sqrt{2}}{5}}$

6.  $\sqrt{\frac{53}{9}} = \boxed{\frac{\sqrt{53}}{3}}$

Write the complex number in standard form.

7.  $\sqrt{-99} = \sqrt{99} \cdot \sqrt{-1} = \sqrt{9 \cdot 11} \cdot \sqrt{-1} = \boxed{3i\sqrt{11}}$

8.  $\sqrt{-196} = \sqrt{196} \cdot \sqrt{-1} = \boxed{14i}$

9.  $\sqrt{-80} = \sqrt{80} \cdot \sqrt{-1} = \sqrt{16 \cdot 5} \cdot \sqrt{-1} = \boxed{4i\sqrt{5}}$

10.  $2 + \sqrt{-27} = 2 + \sqrt{9 \cdot 3} \cdot \sqrt{-1} = \boxed{2 + 3i\sqrt{3}}$

11.  $6 - \sqrt{-162} = 6 - \sqrt{81 \cdot 2} \cdot \sqrt{-1} = \boxed{6 - 9i\sqrt{2}}$

12.  $-3 + \sqrt{44} = -3 + \sqrt{4 \cdot 11} \cdot \sqrt{-1} = \boxed{-3 + 2i\sqrt{11}}$

Write the expression as a complex number in standard form.

13.  $6i + (-2 - 7i) = \boxed{-2 - i}$

14.  $(1 - 4i) - (1 + 3i) = \boxed{-7i}$

15.  $(2 + 5i) + (5 - 2i) = \boxed{7 + 3i}$

16.  $(-7 - 12i) + (4 + 5i) = \boxed{-3 - 7i}$

$$17. (1-i) - (6+i) = \boxed{-5-2i} \quad (\text{distribute negative})$$

$$18. (9-8i) - (4-13i) = \boxed{5+5i} \quad (\text{distribute negative})$$

$$19. (-2+3i) + (2-3i) = \boxed{0}$$

$$20. (4-i) - (-6+7i) = \boxed{10-8i} \quad (\text{distribute negative})$$

$$21. 6i + (-7+i) - 2 = \boxed{-9+7i}$$

$$22. 7 - (-10+i) + 4i = \boxed{17+3i} \quad (\text{distribute negative})$$

$$\text{F.O.I.L. } 23. (1+3i)(-2+i) = -2+i-6i+3i^2 = \boxed{-5-5i}$$

$$\text{F.O.I.L. } 24. (-2-5i)(2-2i) = -4+4i-10i+10i^2 = \boxed{-14-6i}$$

$$25. (3-2i)7i = 21i - 14i^2 = \boxed{14+21i}$$

$$26. (7+i)5i = 35i + 5i^2 = \boxed{-5+35i}$$

$$27. (-2+2i)^2 = (-2+2i)(-2+2i) = 4-4i-4i+4i^2 = \boxed{-8i}$$

$$28. (1-i)(2-6i) = 2-6i-2i+6i^2 = \boxed{-4-8i}$$

$$29. -(2+3i)(1-4i) = -(2-8i+3i-12i^2) =$$

$$= -(14-5i) \quad (\text{distribute negative})$$

$$= \boxed{-14+5i}$$

$$30. (3+5i)^2 = (3+5i)(3+5i) = 9+15i+15i+25i^2 = \boxed{-16+30i}$$

$$\text{F.O.I.L. } 31. 4i(3-i)(-2+8i) = 4i(-6+24i+2i-8i^2)$$

$$= 4i(2+26i)$$

$$= 8i+104i^2$$

$$= \boxed{-104+8i}$$

$$\begin{aligned}
 32. \quad -3i(2-i)(4-5i) &= -3i(8-10i-4i+5i^2) \\
 &= -3i(3-14i) \\
 &= -9i+42i^2 \\
 &= \boxed{-42-9i}
 \end{aligned}$$

$$33. \quad \frac{3i}{(4-i)} \cdot \frac{(4+i)}{(4+i)} = \frac{12i+3i^2}{16-i^2} = \frac{-3+12i}{17} = \boxed{\frac{-3}{17} + \frac{12i}{17}}$$

$$\begin{aligned}
 34. \quad \frac{(6+2i)}{(4+8i)} \cdot \frac{(4-8i)}{(4-8i)} &= \frac{24-48i+8i-16i^2}{16-64i^2} \\
 &= \frac{40-40i}{80} \\
 &= \boxed{\frac{1}{2} - \frac{i}{2}}
 \end{aligned}$$

$$35. \quad \text{(SKIP)} \quad \frac{(2+4i)}{(4-i)} = \frac{(2+4i)(4+i)}{(4-i)(4+i)} = \frac{8+4i+16i+4i^2}{16-i^2} = \frac{8+20i-4}{17} = \frac{4+20i}{17}$$

$$37. \quad \text{A. } 2+2i$$

$$\text{B. } 3-i$$

$$\text{C. } -4+i$$

$$38. \quad \text{A. } -3-2i$$

$$\text{B. } -1+3i$$

$$\text{C. } 2-3i$$