Review-Fractions & Square Roots

1. $-\frac{9}{4} \cdot \frac{1}{3} = \frac{-9}{12} = \boxed{\frac{-3}{4}}$

2. $-2 \cdot \frac{3}{7} = -\frac{2}{1} \cdot \frac{3}{7} = \boxed{\frac{-6}{7}}$

3. $-2\frac{3}{8} \cdot 2\frac{1}{2} = -\frac{19}{8} \cdot \frac{5}{2} = \boxed{\frac{-95}{16}}$

4. $-\frac{5}{21} \div \frac{-10}{7} = \frac{-5}{21} \cdot \frac{-7}{10} = \frac{35}{210} = \boxed{\frac{1}{6}}$

5. $-\frac{9}{5} \div 2 = -\frac{9}{5} \cdot \frac{1}{2} = \boxed{\frac{-9}{10}}$

6. $-3\frac{7}{10} \div 2\frac{1}{4} = -\frac{37}{10} \div \frac{9}{4} = -\frac{37}{10} \cdot \frac{4}{9} = \frac{-148}{90} = \boxed{\frac{-74}{45}}$

7. $6 - \frac{1}{6} = \frac{6}{1} - \frac{1}{6} = \frac{36}{6} - \frac{1}{6} = \boxed{\frac{35}{6}}$

8. $-\frac{4}{5} - \frac{7}{8} = -\frac{4}{5} \cdot \frac{8}{8} - \frac{7}{8} \cdot \frac{5}{5} = \frac{-32-35}{40} = \boxed{\frac{-67}{40}}$

9. $\frac{9}{5} + \left(\frac{-4}{3}\right) = \frac{9}{5} \cdot \frac{3}{3} - \frac{4}{3} \cdot \frac{5}{5} = \frac{21-20}{15} = \boxed{\frac{1}{15}}$

10. $2 - \frac{13}{8} = \frac{16}{8} - \frac{13}{8} = \boxed{\frac{3}{8}}$

11. $-1+\left(-2\frac{2}{5}\right) = -1-\frac{12}{5} = -\frac{5}{5}-\frac{12}{5} = \boxed{\frac{-17}{5}}$

12. $2\frac{4}{5}-\frac{5}{8} = \frac{14}{5}\cdot\frac{8}{8}-\frac{5}{8}\cdot\frac{5}{5} = \frac{112-25}{40} = \boxed{\frac{87}{40}}$

13. $\frac{-1}{3}\div\frac{35}{36} = \frac{-1}{3}\cdot\frac{36}{35} = \boxed{\frac{-12}{35}}$

14. $\frac{2\left(-\frac{1}{6}\right)}{1-\left(-\frac{1}{6}\right)^2} = \frac{-\frac{2}{6}}{\frac{36}{36}\cdot 1-\frac{1}{36}} = \frac{-\frac{2}{6}}{\frac{36-1}{36}} = \frac{-2}{6}\cdot\frac{36}{35} = \boxed{\frac{-12}{35}}$

15. $\frac{2\left(\frac{3}{4}\right)}{1-\left(\frac{3}{4}\right)^2} = \frac{\frac{6}{4}}{\frac{16}{16}\cdot 1-\frac{9}{16}} = \frac{\frac{6}{4}}{\frac{16-9}{16}} = \frac{6}{4}\cdot\frac{16}{7} = \boxed{\frac{24}{7}}$

16. $\frac{1-\frac{24}{25}}{-\frac{7}{25}} = \frac{\frac{25}{25}-\frac{24}{25}}{-\frac{7}{25}} = \frac{1}{25}\cdot\frac{-25}{7} = \boxed{\frac{-1}{7}}$

17. $\sqrt{3}\left(-5\sqrt{10}+\sqrt{6}\right) = -5\sqrt{30}+\sqrt{18} = \boxed{-5\sqrt{30}+3\sqrt{2}}$

18. $-2\sqrt{15}\left(-3\sqrt{3}+3\sqrt{5}\right) = 6\sqrt{45}-6\sqrt{75} =$
$= 6\cdot 3\sqrt{5}-6\cdot 5\sqrt{3} = \boxed{18\sqrt{5}-30\sqrt{3}}$

19. $(\sqrt{2}+\sqrt{5})(\sqrt{2}-\sqrt{5}) = \sqrt{4}-\sqrt{10}+\sqrt{10}-\sqrt{25}$
$= 2-5 = \boxed{-3}$

20. $(5+4\sqrt{3})(3+\sqrt{3}) = 15 + 5\sqrt{3} + 12\sqrt{3} + 4\sqrt{9}$
$= 15 + 17\sqrt{3} + 12 = \boxed{27 + 17\sqrt{3}}$

21. $\frac{\sqrt{15}}{5\sqrt{20}} = \frac{\sqrt{15}}{10\sqrt{5}} = \boxed{\frac{\sqrt{3}}{10}}$

22. $\frac{3-3\sqrt{3}}{4\sqrt{8}} = \frac{(3-3\sqrt{3})}{8\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}-3\sqrt{6}}{8\cdot 2} = \boxed{\frac{3\sqrt{2}-3\sqrt{6}}{16}}$

23. $\frac{(3+\sqrt{2})}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{3\sqrt{10}+\sqrt{20}}{10} = \boxed{\frac{3\sqrt{10}+2\sqrt{5}}{10}}$

24. $\frac{3}{(4+4\sqrt{5})} \cdot \frac{(4-4\sqrt{5})}{(4-4\sqrt{5})} = \frac{12-12\sqrt{5}}{16-16\cdot 5} = \frac{12-12\sqrt{5}}{16-80}$

$= \frac{12-12\sqrt{5}}{-64} = \frac{3-3\sqrt{5}}{-16}$ OR $\boxed{\frac{-3+3\sqrt{5}}{16}}$

25. $\frac{4}{(\sqrt{2}-5\sqrt{3})} \cdot \frac{(\sqrt{2}+5\sqrt{3})}{(\sqrt{2}+5\sqrt{3})} = \frac{4\sqrt{2}+20\sqrt{3}}{2-25\cdot 3} = \frac{4\sqrt{2}+20\sqrt{3}}{-73}$
$= \boxed{\frac{-4\sqrt{2}-20\sqrt{3}}{73}}$

26. $\frac{(3-4\sqrt{3})}{(4\sqrt{5}+3\sqrt{2})} \cdot \frac{(4\sqrt{5}-3\sqrt{2})}{(4\sqrt{5}-3\sqrt{2})} = \frac{12\sqrt{5}-9\sqrt{2}-16\sqrt{15}+12\sqrt{6}}{16\cdot 5 - 9\cdot 2}$
$= \boxed{\frac{12\sqrt{5}-9\sqrt{2}-16\sqrt{15}+12\sqrt{6}}{62}}$

27. $\left(\frac{2}{\sqrt{3}}\right)^2 - \left(\frac{4}{\sqrt{3}}\right)^2 = \frac{4}{3} - \frac{16}{3} = -\frac{12}{3} = \boxed{-4}$

28. $2\left(\frac{6}{\sqrt{37}}\right)^2 - 1 = 2\left(\frac{36}{37}\right) - \frac{37}{37} = \frac{72}{37} - \frac{37}{37} = \boxed{\frac{35}{37}}$

29. $1 - 2\left(\frac{6}{\sqrt{216}}\right)^2 = \frac{216}{216} - 2\cdot\frac{36}{216} = \frac{216-72}{216} = \frac{144}{216} = \boxed{\frac{2}{3}}$

30. $\frac{-3\sqrt{5}}{1-\left(-\frac{3\sqrt{5}}{2}\right)^2} = \frac{-3\sqrt{5}}{\frac{4}{4}-\frac{45}{4}} = \frac{-3\sqrt{5}}{\frac{-41}{4}} = -3\sqrt{5}\cdot\left(\frac{-4}{41}\right)$

$= \boxed{\frac{12\sqrt{5}}{41}}$

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

32. $\sqrt{\frac{1-\frac{\sqrt{3}}{2}}{2}} = \frac{\sqrt{\frac{2-\sqrt{3}}{2}}}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{\frac{(2-\sqrt{3})\cdot 2}{2}}}{2} = \boxed{\frac{\sqrt{2-\sqrt{3}}}{2}}$

33. $\sqrt{\frac{\frac{2+\sqrt{3}}{2}}{2}} = \frac{\sqrt{\frac{2+\sqrt{3}}{\sqrt{2}}}}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \boxed{\frac{\sqrt{2+\sqrt{3}}}{2}}$

34. $\sqrt{\frac{2+\frac{2}{5\sqrt{3}}}{2}} = \sqrt{\frac{\frac{10\sqrt{3}+2}{5\sqrt{3}}}{2}} = \sqrt{\frac{10\sqrt{3}+2}{5\sqrt{3}}\cdot\frac{1}{2}} = \sqrt{\frac{(5\sqrt{3}+1)}{5\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}}$

$= \sqrt{\frac{15+\sqrt{3}}{15}\cdot\frac{15}{15}} = \boxed{\frac{\sqrt{225+15\sqrt{3}}}{15}}$