Foundations Midterm Study Guide

1. $(5x^3+6x-1)+(-3x+7)$

$5x^3+6x-1$

$\underline{\quad -3x+7}$

$5x^3+3x+6$

$\boxed{5x^3+3x+6}$

2. $(r^2s+3rs)+(4r^2s-8rs)+(6r^2s+14rs)$

$1r^2s+3rs$

$+4r^2s-8rs$

$\underline{+6r^2s+14rs}$

$11r^2s+9rs$

$\boxed{11r^2s+9rs}$

3. $(9ab^2-5ab+6a^2b)+(8ab-12a^2b+6)+(6ab^2+5a^2b-14)$

$9ab^2-5ab+6a^2b$

$+8ab-12a^2b+6$

$\underline{6ab^2+5a^2b-14}$

$15ab^2+3ab-1a^2b-8$

$\boxed{15ab^2+3ab-1a^2b-8}$

4. $(2b^3+5b^2-8)-1(4b^3+b-12)$

$2b^3+5b^2-8$

$\underline{-4b^3-b+12}$

$-2b^3+5b^2-b+4$

$\boxed{-2b^3+5b^2-b+4}$

5. $7b-1(4b^2+3b-12)$

$7b-4b^2-3b-12$

$-4b^2+4b-12$

$-4b^2+4b-12$

6. $(-2x^2y-xy+3x-4)-1(4xy-7x+4)$

$-2x^2y-1xy+3x-4$

$-4xy+7x-4$

$-2x^2y-5xy+10x-8$

$-2x^2y-5xy+10x-8$

7. $(-5ab^2+4ab-3a^2b)-(7-5ab+3ab^2+4a^2b)$

$-5ab^2+4ab-3a^2b$

$-3ab^2+5ab-4a^2b-7$

$-8ab^2+9ab-7a^2b-7$

$-8ab^2+9ab-7a^2b-7$

8. $(a^2b^4)(a^3b^5)$

a^5b^9

9. $(6x^9y^7z^4)(2x^3y^5)(y^6z^8)$

$12x^{12}y^{18}z^{12}$

10. $(-4a^7b^3c)(-4a^8bc^{12})(-2ab^2c^2)$

$-32a^{16}b^6c^{15}$

11. $(\frac{1}{2}x^9y^7z^4)(-2x^3y^5)$

$-1x^{12}y^{12}z^4$

12. $(2p^5q^9r^6)(\frac{3}{8}p^8qr)(\frac{3}{4}p^2q^3r^4)$

$\frac{9}{16}p^{15}q^{13}r^{11}$

13. $(x^4)^5$

x^{20}

14. $(m^5n^7)^6$

$m^{30}n^{42}$

15. $(x^4y^9z^{11})^3$

$x^{12}y^{27}z^{33}$

16. $(a^5b^1c^7d^9)^4$

$a^{20}b^4c^{28}d^{36}$

17. $(-3a^3b^7)^3$

$-3^3a^9b^{21}$

$-27a^9b^{21}$

18. $(8m^3n^4)^2$

$8^2m^6n^8$

$64m^6n^8$

19. $(-x^{11}y^{10}z^6)^4$

$(-1x^{11}y^{10}z^6)^4$

$(-1)^4x^{44}y^{40}z^{24}$

$1x^{44}y^{40}z^{24}$

20. $(-6a^3)^2(5a^2)$

$(-6)^2a^6(5a^2)$

$(36a^6)(5a^2)$

$180a^8$

21. $(2x^3y^4)^4(5x^7y^3)$

$(2^4x^{12}y^{16})(5x^7y^3)$

$(16x^{12}y^{16})(5x^7y^3)$

$80x^{19}y^{19}$

22. $(3s^5t^8)^3(8s^1t^7)^2(s^3t^4)$

$(3^3s^{15}t^{24})(8^2s^2t^7)(s^3t^4)$

$(27s^{15}t^{24})(64s^2t^7)(s^3t^4)$

$1728s^{20}t^{35}$

23. $\frac{x^0}{x^4y^{-2}} = \frac{1y^2}{x^4}$

24. $\frac{m^7p^3}{m^4n^2p^{-6}} = \frac{m^7p^3p^6}{m^4n^2} = \frac{m^3p^9}{n^2}$

25. $\left(\frac{6x^2}{y^{-3}}\right)^{-2} = \frac{6^{-2}x^{-4}}{y^6} = \frac{1}{6^2x^4y^6} = \frac{1}{36x^4y^6}$

26. $\left(\frac{x^3y^0}{x^{-2}y^0}\right) = x^3x^2 = x^5$

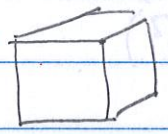
27. $\frac{4x^5}{2x^3} = \boxed{2x^2}$

28. $\frac{y^0 x^{-2}}{x^4 z^2} = \frac{1}{x^4 x^2 z^2} = \boxed{\frac{1}{x^6 z^2}}$

29. $\left(\frac{3x^4}{(2y^0)(-2x^0)}\right)^{-2} = \left(\frac{3^1 x^4}{-4^1}\right)^{-2} = \frac{3^{-2} x^{-8}}{(-4)^{-2}} \quad \frac{(-4)^2}{3^2 x^8} = \boxed{\frac{16}{9x^8}}$

30. $\left(\frac{m^6 n^2}{m^{-3} n^2}\right)^0 = \boxed{1}$

31. $\frac{56x^{-3}y^4}{8x^2y^{-2}} = \frac{56y^4y^2}{8x^2x^3} = \boxed{\frac{7y^6}{x^5}}$

32. 

$3x^2y$

$V = s^3 \quad V = (3x^2y)^3$

$V = 3^3 x^6 y^3$

$\boxed{V = 27x^6y^3}$

33. $A = \frac{bh}{2} \quad A = \frac{(2x^2)(4x+2)}{2} = \frac{8x^3+4x^2}{2} = \boxed{4x^3+2x^2}$

34. $(2x+1)^2$

$(2x+1)(2x+1)$

$4x^2+2x+2x+1$

$\boxed{4x^2+4x+1}$

	$2x$	$+1$
$2x$	$4x^2$	$+2x$
$+1$	$+2x$	$+1$

$\boxed{4x^2+4x+1}$

35. $3(x+8)^2+4$

$3(x+8)(x+8)+4$

$3(x^2+8x+8x+64)+4$

$3(x^2+16x+64)+4$

$3x^2+48x+192+4$

$3x^2+48x+196$

	x	$+8$
x	x^2	$8x$
$+8$	$8x$	16

$\boxed{3x^2+48x+196}$

36. $5x^2y^1(2x^2y^1 - 8x^1 + 3x^1y^1)$

$10x^4y^2 - 40x^3y + 15x^3y^2$

37. $(2x+1)(x-4)$

$2x^2 - 8x + 1x - 4$

$2x^2 - 7x - 4$

	$2x$	$+1$
x	$2x^2$	$1x$
-4	$-8x$	-4

38. $\frac{21 \div 3 + 3 \times 5}{14 - 6 \div 2} = \frac{7 + 15}{14 - 3} = \frac{22}{11} = 2$

39. $3^3 - 4\left(\sqrt[3]{64} - 2\right)^2$

$27 - 4(4-2)^2$

$27 - 4(2)^2$

$27 - 4(4)$

$27 - 16$

11

40. -11.3

$\times 22.1$

113

2260

22600

-249.73

41. $7 - 2(5-3)^2$

$7 - 2(2)^2$

$7 - 2(4)$

$7 - 8$

-1

42. 18.63

-5.40

13.23

43. $1\frac{1}{4} + 3\frac{3}{5} = \frac{5}{5}\cdot\frac{5}{4} + \frac{18}{5}\cdot\frac{4}{4} \quad \frac{25}{20} + \frac{72}{20} = \boxed{\frac{97}{20} = 4\frac{17}{20}}$

44. $\left(\frac{2}{2}\cdot\frac{1}{3}\right) - \frac{5}{6} = \frac{2}{6} - \frac{5}{6} = \frac{-3}{6} = \boxed{\frac{-1}{2}}$

45. $\frac{5}{6} + \left(\frac{1}{3}\cdot\frac{2}{2}\right) = \frac{5}{6} + \frac{2}{6} = \boxed{\frac{7}{6} = 1\frac{1}{6}}$

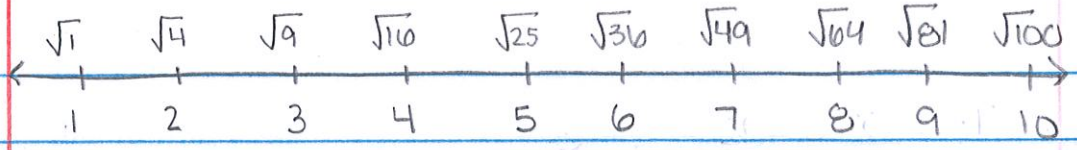
46. $\left(\frac{2}{2}\cdot\frac{2}{5}\right) + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \boxed{\frac{7}{10}}$

47. $\left(\frac{4}{4}\cdot\frac{2}{3}\right) - \frac{1}{12} = \frac{8}{12} - \frac{1}{12} = \boxed{\frac{7}{12}}$

48. $2\frac{1}{4} + 3\frac{1}{3} = \left(\frac{3}{3}\cdot\frac{9}{4}\right) + \frac{10}{3}\left(\frac{4}{4}\right) = \frac{27}{12} + \frac{40}{12} = \boxed{\frac{67}{12} = 5\frac{7}{12}}$

49. $6\frac{5}{6} - \frac{4}{5} = \left(\frac{5}{5}\cdot\frac{41}{6}\right) - \left(\frac{4}{5}\cdot\frac{6}{6}\right) = \frac{205}{30} - \frac{24}{30} = \boxed{\frac{181}{30} = 6\frac{1}{30}}$

50. $1\frac{1}{6} + 2\frac{2}{3} - 1\frac{1}{4} = \left(\frac{2}{2}\cdot\frac{7}{6}\right) + \left(\frac{4}{4}\cdot\frac{8}{3}\right) - \left(\frac{3}{3}\cdot\frac{5}{4}\right) = \frac{14}{12} + \frac{32}{12} - \frac{15}{12} = \boxed{\frac{31}{12} = 2\frac{7}{12}}$



51. $\sqrt{72} \Rightarrow$ $\sqrt{64}$ $\sqrt{72}$ $\sqrt{81}$

8 8.4 9

52. $\sqrt{59} \Rightarrow$ $\sqrt{49}$ $\sqrt{59}$ $\sqrt{64}$

7 7.7 8

53. $\sqrt{41} < 7.4$ $\quad \sqrt{41} \Rightarrow$ $\sqrt{36}$ $\sqrt{41}$ $\sqrt{49}$

6 6.4 7

54. $6, \sqrt{48}, \frac{37}{6}$ $\quad \sqrt{48} \Rightarrow$ $\sqrt{36}$ $\sqrt{48}$ $\sqrt{49}$

6 6.9 7

order:

$6, \frac{37}{6}, \sqrt{48}$

$$
\begin{array}{r}
6.1 \\
6\overline{)37.0} \\
-36\downarrow \\
\hline
10 \\
-6 \\
\hline
4
\end{array}
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