TEST 3 – A

1E2 – 28.11.13

Q1

a) $\frac{5x^3y^2}{3y^3(4^3x)^0} = \frac{5x^3}{3y}$

b) $3x^{-2}\frac{x}{5x^{-3}} = \frac{3}{5}x^{-2}\cdot x\cdot x^3 = \frac{3x^2}{5}$

c) $\left(\frac{(3a^7b^4)^{-2}}{4a^3}\right)^{-1} = 4a^3(3a^7b^4)^2 = 4a^3\cdot 9\cdot a^{14}\cdot b^8 = 36a^{17}b^8$

d) $\frac{6x^2}{3y^2}\cdot\frac{2xy}{5x^2} = \frac{4x}{5y}$

e) $(x^n)^3\cdot x^{-3n} = x^{3n-3n} = x^0 = 1$

f) $(5x)^{-1}\cdot\frac{x}{5} = \frac{1}{5x}\cdot\frac{x}{5} = \frac{1}{25}$

Q2

a) $\sqrt{3\sqrt{7}+3\sqrt{3}}\sqrt{3\sqrt{7}-3\sqrt{3}} = \sqrt{(3\sqrt{7})^2-(3\sqrt{3})^2}$
$= \sqrt{9\cdot 7-9\cdot 3} = \sqrt{63-27} = \sqrt{36} = 6$

b) $2\sqrt{27}-\sqrt{48}+5\sqrt{3} = 6\sqrt{3}-4\sqrt{3}+5\sqrt{3} = 7\sqrt{3}$
(da $9\cdot 3$; da $16\cdot 3$)

c) $\sqrt{245} = \sqrt{49\cdot 5} = 7\sqrt{5}$

d) $(\sqrt{81}-x)^2 = (9-x)^2 = 81-18x+x^2$

Q3

a) $5\cdot 10^{-3}\cdot 4\cdot 10^4\cdot 25\cdot 10^3 = 50\cdot 10^4 = 5\cdot 10^5$

b) $(0{,}00005)^6 = (5\cdot 10^{-5})^6 = 1'5625\cdot 10^{-30} = 1{,}5625\cdot 10^{-26}$

c) $0{,}5\cdot 10^6 - 0{,}2\cdot 10^3 = 500\cdot 10^3 - 92\cdot 10^3 = 499{,}8\cdot 10^3$
$= 4{,}998\cdot 10^5$

TEST 3 - B

Q1

a) $\frac{4x^2y^3}{3y^2(3x)^0} = \frac{4}{3}x^2y$

b) $4x^{-2} \cdot \frac{x}{5x^{-4}} = \frac{4}{5}x^{-2} \cdot x \cdot x^4 = \frac{4}{5}x^3$

c) $(2y)^{-1} \cdot \frac{y}{2} = \frac{1}{2y} \cdot \frac{y}{2} = \frac{1}{4}$

d) $\left(\frac{(5a^7b^3)^{-3}}{4a^3}\right)^{-1} = 4a^3(5a^7b^3)^2 = 4a^3 \cdot 25 \cdot a^{14} \cdot b^6 = 100a^{17}b^6$

e) $\frac{4x^2}{2y^2} \cdot \frac{2xy}{3x^2} = \frac{4x}{3y}$

f) $(x^n)^2 \cdot x^{-2n} = x^{2n-2n} = x^0 = 1$

Q2

a) $\sqrt{4\sqrt{5}+2\sqrt{11}}\sqrt{4\sqrt{5}-2\sqrt{11}} = \sqrt{(4\sqrt{5})^2-(2\sqrt{11})^2} = \sqrt{16\cdot5-4\cdot11}$
$= \sqrt{80-44} = \sqrt{36} = 6$

b) $2\sqrt{32}-\sqrt{72}+5\sqrt{2} = 8\sqrt{2}-6\sqrt{2}+5\sqrt{2} = 7\sqrt{2}$

c) $\sqrt{320} = \sqrt{64\cdot5} = 8\sqrt{5}$

d) $(\sqrt{121}+x)^2 = (11+x)^2 = 121+22x+x^2$

Q3

a) $0{,}004 \cdot 50'000 \cdot 0{,}0025 = 4\cdot10^{-3} \cdot 5\cdot10^4 \cdot 2{,}5\cdot10^3$
$= 50\cdot10^4 = 5\cdot10^5$

b) $(0{,}00004)^6 = (4\cdot10^{-5})^6 = 4096\cdot10^{-30} = 4{,}096\cdot10^{-27}$

c) $0{,}2\cdot10^5 - 0{,}4\cdot10^2 = 200\cdot10^2 - 0{,}4\cdot10^2 = 199{,}6\cdot10^2$
$= 1{,}996\cdot10^4$