2.102. Oblicz:

a) $\left(5^{\sqrt{2}}\right)^{\sqrt{8}} \cdot 25^{\frac{3}{2}} : \sqrt[4]{625^5}$

$5^{1,7} < 5^{\sqrt{3}} < 5^{1,75}$

$\sqrt{5^{17}} = 5^{\frac{17}{10}} < 5^{\sqrt{3}} < 5^{\frac{175}{100}} = \sqrt[4]{5^{7}}$

$19 \cdot 21 = (20-1)(20+1)$

2.102. Oblicz:

a) $\left(5^{\sqrt{2}}\right)^{\sqrt{8}} \cdot 25^{\frac{3}{2}} : \sqrt[4]{625^5} = 5^{\sqrt{2}\cdot 2\sqrt{2}} \cdot \left(5^2\right)^{\frac{3}{2}} : \left(\left(5^4\right)^{\frac{1}{8}}\right)^5 =$

$5^4 \cdot 5^3 : 5^5 =$

$5^2 = \sqrt{25}^3$

$25^{1,5}$

$\sqrt{13} \cdot \sqrt{26} = \sqrt{13}\cdot\sqrt{2}\cdot\sqrt{13} = 13\sqrt{2}$

$2 \cdot 13$

$\sqrt[4]{625^5} = \sqrt[4]{625}^5 = 5^5$

1	2	3	4	5	6	7	8	9	10	11
2	4	8	16	32	64	128	256	512	1024	2048
3	9	27	81	243	729	2187	6561	19683	59049	177147
4	16	64	256	1024	4096	16384	65536	262144	1048576	4194304
5	25	125	625	3125	15625	78125	390625	1953125	9765625	48828125
6	36	216	1296	7776	46656	279936	1679616	10077696	60466176	362797056
7	49	343	2401	16807	117649	823543	5764801	40353607	282475249	1977326743
8	64	512	4096	32768	262144	2097152	16777216	134217728	1073741824	8589934592
9	81	729	6561	59049	531441	4782969	43046721	387420489	3486784401	31381059609
10	100	1000	10000	100000	1000000	10000000	100000000	1000000000	10000000000	1E+11
11	121	1331	14641	161051	1771561	19487171	214358881	2357947691	25937424601	2,85312E+11
12	144	1728	20736	248832	2985984	35831808	429981696	5159780352	61917364224	7,43006E+11
13	169	2197	28561	371293	4826809	62748517	815730721	10604499373	137858E+11	1,79216E+12
14	196	2744	38416	537824	7529536	105413504	1475789056	20661046784	2,89255E+11	4,04957E+12
15	225	3375	50625	759375	11390625	170859375	2562890625	38443359375	5,7665E+11	8,64976E+12
16	256	4096	65536	1048576	16777216	268435456	4294967296	68719476736	1,09951E+12	1,75922E+13
17	289	4913	83521	1419857	24137569	410338673	6975757441	1,18588E+11	2,01596E+12	3,42719E+13
18	324	5832	104976	1889568	34012224	612220032	11019960576	1,98359E+11	3,57047E+12	6,42684E+13
19	361	6859	130321	2476099	47045881	893871739	16983563041	3,22688E+11	6,13107E+12	1,1649E+14
20	400	8000	160000	3200000	64000000	1280000000	25600000000	5,12E+11	1,024E+13	2,048E+14
21	441	9261	194481	4084101	85766121	1801088541	37822859361	7,9428E+11	1,66796E+13	3,50278E+14
22	484	10648	234256	5153632	1,13E+08	2494357888	54875873536	1,20727E+12	2,65599E+13	5,84318E+14
23	529	12167	279841	6436343	1,48E+08	3404825447	78310985281	1,80115E+12	4,14265E+13	9,5281E+14
24	576	13824	331776	7962624	1,91E+08	4586471424	1,10075E+11	2,64181E+12	6,34034E+13	1,52168E+15
25	625	15625	390625	9765625	2,44E+08	6103515625	1,52588E+11	3,8147E+12	9,53674E+13	2,38419E+15
26	676	17576	456976	11881376	3,09E+08	8031810176	2,08827E+11	5,4295E+12	1,41167E+14	3,67034E+15

LOGARYTMY.

Wprowadzenie do logarytmów

Logarytm wygląda następująco:

$\log_a b = c$ – wynik logarytmowania

b – liczba logarytmowana

a – podstawa logarytmu

Powyżej zapisany logarytm przeczytamy: "logarytm liczby b przy podstawie a" lub "logarytm przy podstawie a z liczby b".

$\sqrt{a}$ $a > 0$

$\frac{1}{\pi}$ $\pi \neq 0$

$\frac{1}{\sqrt{\pi}}$ $\pi > 0$ zał

$\log_a b = c \iff a^c = b$ def

zał:

1. $a > 0$
2. $a \neq 1$
3. $b > 0$

$c \in \mathbb{R}$

d) $\log_{\frac{1}{3}} \frac{81}{16} = c \iff \left(\frac{3}{2}\right)^c = \frac{81}{16} = \frac{3^4}{2^4} = \left(\frac{3}{2}\right)^4 = \left(\frac{2}{3}\right)^{-4}$

$\log_a b = c \iff a^c = b$

$a \quad b \quad -4$

$c = -4$

h) $\log_{\frac{1}{5}} 1 = c \iff \left(\frac{1}{5}\right)^c = 1 = \left(\frac{1}{5}\right)^0$

$c = 0$

$\left(\frac{1}{5}\right)^{-1} = \left(\frac{5}{1}\right)^1 = 5$

$a^0 = 1$

d) $\log_{\frac{1}{3}} x = -\frac{1}{2} \iff \left(\frac{1}{3}\right)^{-\frac{1}{2}} = x = 3^{\frac{1}{2}} = \sqrt{3}$

zał: $x > 0$

odp $x = \sqrt{3}$

h) $\log_{2\sqrt{2}} x = -3 \iff (2\sqrt{2})^{-3} = x = \left(\frac{1}{2}\right)^{\frac{3}{2}}$

zał: $x > 0$

$(2^1 \cdot 2^{\frac{1}{2}})^{-3} = (2^{\frac{3}{2}})^{-3} = \left(\frac{1}{2}\right)^{\frac{9}{2}} = \left(\frac{1}{2}\right)^4 \cdot \left(\frac{1}{2}\right)^{\frac{1}{2}} \cdot \left(\frac{1}{2}\right)^{\frac{1}{2}}$

$x = \frac{1}{16}\sqrt{\frac{1}{2}} = \left(\frac{1}{2}\right)^{\frac{2}{2}}$

$\log_a b = c \iff a^c = b$

2.102 – 2.110