

השתמש בחוקי חזקות על מנת לפתור את התרגילים הבאים:

מהו הערך של x^2 עבור הערכים הבאים? השלם את הטבלה:

1.	$x = 0$	
2.	$x = 2$	
3.	$x = 10$	
4.	$x = 5$	
5.	$x = 13$	
6.	$x = 9$	
7.	$x = 7$	
8.	$x = 12$	
9.	$x = 6$	
10.	$x = 11$	
11.	$x = 1$	
12.	$x = 14$	
13.	$x = 3$	
14.	$x = 15$	
15.	$x = 4$	
16.	$x = 8$	

מהו הערך של x^3 עבור הערכים הבאים? השלם את הטבלה:

1.	$x = 2$	
2.	$x = 10$	
3.	$x = 6$	
4.	$x = 3$	
5.	$x = 5$	
6.	$x = 0$	
7.	$x = 4$	

בהנחה ש- $x = 2$ השלם את הטבלה:

1.	x^0	
2.	x^2	
3.	x^3	
4.	x^4	
5.	x^5	
6.	x^6	

בהנחה ש- $x = 3$ השלם את הטבלה:

1.	x^0	
2.	x^2	
3.	x^3	
4.	x^4	
5.	x^5	

פתור את התרגילים הבאים:

1.	$2^6 =$	6.	$-5^3 =$	11.	$(-1)^7 =$	16.	$12^2 =$
2.	$-6^2 =$	7.	$(-3)^5 =$	12.	$17^0 =$	17.	$(-6)^0 =$
3.	$(-4)^2 =$	8.	$7^2 =$	13.	$(-9)^1 =$	18.	$-500^1 =$
4.	$-3^4 =$	9.	$(-9)^2 =$	14.	$13^2 =$	19.	$(-3)^3 =$
5.	$(-5)^2 =$	10.	$15^2 =$	15.	$-7^0 =$	20.	$0^1 =$

פתור את התרגילים הבאים:

1.	$2^3 \times 2^3 =$	13.	$4^8 \div 4^5 =$
2.	$5 \times 5^2 =$	14.	$\frac{3^2 \times 3^4}{3 \times 3^5} =$
3.	$3^2 \times 3^3 =$	15.	$\frac{2^3 \times 2^9}{2^2 \times 2^4} =$
4.	$4^2 \times 4^2 =$	16.	$\frac{4^5 \times 4^3}{4^4 \times 4^2} =$
5.	$6^1 \times 6^2 =$	17.	$\frac{10^7 \times 10^3}{10^6 \times 10^2} =$
6.	$10^2 \times 10^3 =$	18.	$\frac{5^9 \times 5^4}{5^7 \times 5^4} =$
7.	$1^{10} \times 1^{21} =$	19.	$\frac{8^8 \times 8^7}{8^9 \times 8^5} =$
8.	$8^{10} \div 8^8 =$	20.	$\frac{a^{10} \times a^2}{a^3 \times a^7} =$
9.	$12^4 \div 12^2 =$	21.	$\frac{x^2 \times x^3}{x \times x^4} =$
10.	$2 \div 2^1 =$	22.	$\frac{y^5 \times y^6}{y^7 \times y^2} =$
11.	$5^7 \div 5^4 =$	23.	$a^{18} \div a^{10} \times a^3 =$
12.	$7^{12} \div 7^{10} =$	24.	$a^{18} \div (a^{10} \times a^3) =$

25.	$a^{18} \div a^{10} \div a^3 =$
26.	$\frac{-2^2 \times 2^4}{2 \times 2^3} =$
27.	$\frac{(-3)^2 \times 3^5}{3^0 \times 3^3} =$
28.	$\frac{-4^3 \times (-4)^3}{4^2 \times (-4)^2} =$
29.	$\frac{-5^2 \times 5^8}{5^3 \times 5^4} =$
30.	$\frac{6^3 \times (-6)^4}{6^2 \times 6^3} =$
31.	$\frac{a^7 \times (-a)^{20}}{a^{12} \times (-a)^5} =$
32.	$\frac{-x^2 \times (-x)^3}{x^0 \times (-x)^5} =$
33.	$\frac{y^4 \times y^6}{(-y)^3 \times y^6} =$

פתור את התרגילים הבאים:

1.	$(2^2)^3 =$	11.	$\left(\frac{10}{12}\right)^2 =$
2.	$(-4^3)^2 =$	12.	$\left(-\frac{7}{28}\right)^3 =$
3.	$(5^0)^5 =$	13.	$a^{n \times m} =$
4.	$(-a^5)^3 =$	14.	$\frac{x^n}{y^n} =$
5.	$(-2 \times 3)^3 =$	15.	$x^m \times y^m =$
6.	$(4 \times 5)^2 =$	16.	$\frac{x^n \times x^n}{(x^n)^2} =$
7.	$(-5 \times 6)^2 =$	17.	$\frac{(a^2)^4 \times (a^3)^2}{a \times (a^5)^2} =$
8.	$(7 \times 2)^2 =$	18.	$\frac{(-a)^3 \times (a^2)^6}{(a^2)^4} =$
9.	$\left(-\frac{2}{4}\right)^4 =$	19.	$\frac{(x^2 \times y^2)^3}{x^6 \times y^6} =$
10.	$\left(\frac{1}{3}\right)^5 =$	20.	$\frac{(x \times y)^n}{x^n \times y^n} =$

תרגילי חזקות – תשובות:

מהו הערך של x^2 עבור הערכים הבאים? השלם את הטבלה:

1.	$x = 0$	$x^2 = 0$
2.	$x = 2$	$x^2 = 4$
3.	$x = 10$	$x^2 = 100$
4.	$x = 5$	$x^2 = 25$
5.	$x = 13$	$x^2 = 169$
6.	$x = 9$	$x^2 = 81$
7.	$x = 7$	$x^2 = 49$
8.	$x = 12$	$x^2 = 144$
9.	$x = 6$	$x^2 = 36$
10.	$x = 11$	$x^2 = 121$
11.	$x = 1$	$x^2 = 1$
12.	$x = 14$	$x^2 = 196$
13.	$x = 3$	$x^2 = 9$
14.	$x = 15$	$x^2 = 225$
15.	$x = 4$	$x^2 = 16$
16.	$x = 8$	$x^2 = 64$

מהו הערך של x^3 עבור הערכים הבאים? השלם את הטבלה:

1.	$x = 2$	$x^3 = 8$
2.	$x = 10$	$x^3 = 1000$
3.	$x = 6$	$x^3 = 216$
4.	$x = 3$	$x^3 = 27$
5.	$x = 5$	$x^3 = 125$
6.	$x = 0$	$x^3 = 0$
7.	$x = 4$	$x^3 = 64$

בהנחה ש- $x = 2$ השלם את הטבלה:

1.	x^0	1
2.	x^2	4
3.	x^3	8
4.	x^4	16
5.	x^5	32
6.	x^6	64

בנהח ש - $x = 3$ השלם את הטבלה:

1.	x^0	1
2.	x^2	9
3.	x^3	27
4.	x^4	81
5.	x^5	243

פתור את החזקות הבאות:

1.	$2^6 = 64$	6.	$-5^3 = -125$	11.	$(-1)^7 = -1$	16.	$12^2 = 144$
2.	$-6^2 = -36$	7.	$(-3)^5 = -243$	12.	$17^0 = 1$	17.	$(-6)^0 = 1$
3.	$(-4)^2 = 16$	8.	$7^2 = 49$	13.	$(-9)^1 = -9$	18.	$-500^1 = -500$
4.	$-3^4 = -81$	9.	$(-9)^2 = 81$	14.	$13^2 = 169$	19.	$(-3)^3 = -27$
5.	$(-5)^2 = 25$	10.	$15^2 = 225$	15.	$-7^0 = -1$	20.	$0^1 = 0$

פתור את החזקות הבאות:

1.	$2^3 \times 2^3 = 2^6 = 64$	13.	$4^8 \div 4^5 = 4^3 = 64$
2.	$5 \times 5^2 = 5^3 = 125$	14.	$\frac{3^2 \times 3^4}{3 \times 3^5} = \frac{3^6}{3^6} = 1$
3.	$3^2 \times 3^3 = 3^5 = 243$	15.	$\frac{2^3 \times 2^9}{2^2 \times 2^4} = \frac{2^{12}}{2^6} = 2^6 = 64$
4.	$4^2 \times 4^2 = 4^4 = 256$	16.	$\frac{4^5 \times 4^3}{4^4 \times 4^2} = \frac{4^8}{4^6} = 4^2 = 16$
5.	$6^1 \times 6^2 = 6^3 = 216$	17.	$\frac{10^7 \times 10^3}{10^6 \times 10^2} = \frac{10^{10}}{10^8} = 10^2 = 100$
6.	$10^2 \times 10^3 = 10^5 = 100,000$	18.	$\frac{5^9 \times 5^4}{5^7 \times 5^4} = \frac{5^{13}}{5^{11}} = 5^2 = 25$
7.	$1^{10} \times 1^{21} = 1$	19.	$\frac{8^8 \times 8^7}{8^9 \times 8^5} = \frac{8^{15}}{8^{14}} = 8$
8.	$8^{10} \div 8^8 = 8^2 = 64$	20.	$\frac{a^{10} \times a^2}{a^3 \times a^7} = \frac{a^{12}}{a^{10}} = a^2$
9.	$12^4 \div 12^2 = 12^2 = 144$	21.	$\frac{x^2 \times x^3}{x \times x^4} = \frac{x^5}{x^5} = 1$
10.	$2 \div 2^1 = 2^0 = 1$	22.	$\frac{y^5 \times y^6}{y^7 \times y^2} = \frac{y^{11}}{y^9} = y^2$
11.	$5^7 \div 5^4 = 5^3 = 125$	23.	$a^{18} \div a^{10} \times a^3 = \frac{a^{18}}{a^{10}} \times a^3 = a^8 \times a^3 = a^{11}$
12.	$7^{12} \div 7^{10} = 7^2 = 49$	24.	$a^{18} \div (a^{10} \times a^3) = \frac{a^{18}}{a^{13}} = a^5$

25.	$a^{18} \div a^{10} \div a^3 = \frac{a^{18}}{a^{10}} \div a^3 = \frac{a^8}{a^3} = a^5$
26.	$\frac{-2^2 \times 2^4}{2 \times 2^3} = -\frac{2^6}{2^4} = -2^2 = -4$
27.	$\frac{(-3)^2 \times 3^5}{3^0 \times 3^3} = \frac{3^7}{3^3} = 3^4 = 81$
28.	$\frac{-4^3 \times (-4)^3}{4^2 \times (-4)^2} = \frac{4^6}{4^4} = 4^2 = 16$
29.	$\frac{-5^2 \times 5^8}{5^3 \times 5^4} = -\frac{5^{10}}{5^7} = -5^3 = -125$
30.	$\frac{6^3 \times (-6)^4}{6^2 \times 6^3} = \frac{6^7}{6^5} = 6^2 = 36$
31.	$\frac{a^7 \times (-a)^{20}}{a^{12} \times (-a)^5} = -\frac{a^{27}}{a^{17}} = -a^{10}$
32.	$\frac{-x^2 \times (-x)^3}{x^0 \times (-x)^5} = -\frac{x^5}{x^5} = -1$
33.	$\frac{y^4 \times y^6}{(-y)^3 \times y^6} = -\frac{y^{10}}{y^9} = -y$

פתור את הטבלה הבאה:

1.	$(2^2)^3 = 2^6 = 64$	11.	$\left(\frac{10}{12}\right)^2 = \left(\frac{5}{6}\right)^2 = \frac{25}{36}$
2.	$(-4^3)^2 = 4^6$	12.	$\left(-\frac{7}{28}\right)^3 = \left(-\frac{1}{4}\right)^3 = -\frac{1}{64}$
3.	$(5^0)^5 = 1$	13.	$a^{n \times m} = \left[(a^n)^x\right]^m$
4.	$(-a^5)^3 = (-a)^{15}$	14.	$\frac{x^n}{y^n} = \left(\frac{x}{y}\right)^n$
5.	$(-2 \times 3)^3 = (-6)^3 = -216$	15.	$x^m \times y^m = (x \times y)^m$
6.	$(4 \times 5)^2 = 20^2 = 400$	16.	$\frac{x^n \times x^n}{(x^n)^2} = \frac{x^{2n}}{x^{2n}} = 1$
7.	$(-5 \times 6)^2 = (-30)^2 = 900$	17.	$\frac{(a^2)^4 \times (a^3)^2}{a \times (a^5)^2} = \frac{a^8 \times a^6}{a \times a^{10}} = \frac{a^{14}}{a^{11}} = a^3$
8.	$(7 \times 2)^2 = 14^2 = 196$	18.	$\frac{(-a)^3 \times (a^2)^6}{(a^2)^4} = -\frac{a^3 \times a^{12}}{a^8} = -\frac{a^{15}}{a^8} = -a^7$
9.	$\left(-\frac{2}{4}\right)^4 = \left(-\frac{1}{2}\right)^4 = \frac{1}{16}$	19.	$\frac{(x^2 \times y^2)^3}{x^6 \times y^6} = \frac{(x^2)^3 \times (y^2)^3}{x^6 \times y^6} = \frac{x^6 \times y^6}{x^6 \times y^6} = 1$
10.	$\left(\frac{1}{3}\right)^5 = \frac{1}{243}$	20.	$\frac{(x \times y)^n}{x^n \times y^n} = \frac{x^n \times y^n}{x^n \times y^n} = 1$

פתור את החזקות הבאות ע"י המרת חזקה שלילית לחיובית:

1.	$7^{-1} =$	11.	$\frac{2^{15}}{8^6} =$
2.	$11^{-1} =$	12.	$\frac{3^{-8}}{3^{-5}} =$
3.	1^{-1}	13.	$\frac{9^{-1}}{81^{-1}} =$
4.	$-1^{-1} =$	14.	$\left(\frac{1}{3}\right)^{-3} =$
5.	$(-2)^{-4} =$	15.	$\left(\frac{3}{4}\right)^{-1} \times \left(\frac{4}{3}\right)^2 =$
6.	$(-2)^{-3} =$	16.	$\left(\frac{5}{7}\right)^{-1} \times \frac{7}{5} =$
7.	$3^{-2} =$	17.	$\frac{27 \times 81}{9^4} =$
8.	$4^{-3} =$	18.	$\frac{5^8 \times 5^{-6} + 3^{-2} \times 3^3}{2^{10} \div 2^2 \times 2^{-6}} =$
9.	$\frac{11}{11^3} =$	19.	$\frac{36^{-2} \times 6^2}{3^{-2}} =$
10.	$\frac{8^{10}}{32^6} =$	20.	$\frac{4^3 \times 4^{-5} + 3^2 \times 3^{-3}}{8^{-1}} =$

פתור את החזקות הבאות ע"י המרת חזקה שלילית לחיובית - תשובות:

1.	$7^{-1} = \frac{1}{7}$	11.	$\frac{2^{15}}{8^6} = \frac{2^{15}}{2^{18}} = 2^{-3} = \frac{1}{8}$
2.	$11^{-1} = \frac{1}{11}$	12.	$\frac{3^{-8}}{3^{-5}} = 3^{-3} = \frac{1}{27}$
3.	$1^{-1} = 1$	13.	$\frac{9^{-1}}{81^{-1}} = \frac{9^{-1}}{9^{-2}} = 9$
4.	$-1^{-1} = -1$	14.	$\left(\frac{1}{3}\right)^{-3} = 3^3 = 27$
5.	$(-2)^{-4} = \frac{1}{(-2)^4} = \frac{1}{16}$	15.	$\left(\frac{3}{4}\right)^{-1} \times \left(\frac{4}{3}\right)^2 = \left(\frac{4}{3}\right)^1 \times \left(\frac{4}{3}\right)^2 = \left(\frac{4}{3}\right)^3 = \frac{64}{27}$
6.	$(-2)^{-3} = \frac{1}{(-2)^3} = -\frac{1}{8}$	16.	$\left(\frac{5}{7}\right)^{-1} \times \frac{7}{5} = \frac{7}{5} \times \frac{7}{5} = \frac{49}{25}$
7.	$3^{-2} = \frac{1}{9}$	17.	$\frac{27 \times 81}{9^4} = \frac{3^3 \times 3^4}{3^8} = \frac{3^7}{3^8} = 3^{-1} = \frac{1}{3}$
8.	$4^{-3} = \frac{1}{64}$	18.	$\frac{5^8 \times 5^{-6} + 3^{-2} \times 3^3}{2^{10} \div 2^2 \times 2^{-6}} = \frac{5^2 + 3}{2^8 \times 2^{-6}} = \frac{5^2 + 3}{2^2} = \frac{28}{4} = 7$
9.	$\frac{11}{11^3} = 11^{-2} = \frac{1}{121}$	19.	$\frac{36^{-2} \times 6^2}{3^{-2}} = \frac{6^{-4} \times 6^2}{3^{-2}} = \frac{6^{-2}}{3^{-2}} = \left(\frac{6}{3}\right)^{-2} = 2^{-2} = \frac{1}{4}$
10.	$\frac{8^{10}}{32^6} = \frac{2^{30}}{2^{30}} = 1$	20.	$\frac{4^3 \times 4^{-5} + 3^2 \times 3^{-3}}{8^{-1}} = \frac{4^{-2} + 3^{-1}}{2^{-3}} = \frac{2^{-4} + 3^{-1}}{2^{-3}} = \frac{2^{-4}}{2^{-3}} + \frac{3^{-1}}{2^{-3}} = 2^{-1} + \frac{2^3}{3} = \frac{1}{2} + \frac{8}{3} = \frac{19}{6}$

חשב את ערכי הביטויים הבאים ע"י פירוק לגורמים:

1.	$\frac{8^2}{2^5} =$
2.	$\frac{125^5}{5^{12}} =$
3.	$\frac{64^{10}}{16^{15}} =$
4.	$\frac{81^4}{27^5} =$
5.	$\frac{256}{4^2} =$
6.	$\frac{64^2}{32} =$
7.	$\frac{72^2 \times 12^2}{36^2 \times 16} =$
8.	$\frac{8^9 \times 16^{10}}{32^9 \times 64^3} =$
9.	$\frac{100^3}{25^3} =$
10.	$\frac{128 \times 48^3}{96^3} =$
11.	$\frac{90^3}{40 \times 9^2} =$
12.	$\frac{70^3 \times 9}{42^2 \times 25} =$
13.	$\frac{108 \times 27^2}{18^2} =$
14.	$\frac{98^2 \times 56}{14^3} =$
15.	$\frac{54 \times 18^3}{81 \times 12} =$

חשב את ערכי הביטויים הבאים ע"י פירוק לגורמים - תשובות:

1.	$\frac{8^2}{2^5} = \frac{2^6}{2^5} = 2$
2.	$\frac{125^5}{5^{12}} = \frac{5^{15}}{5^{12}} = 5^3$
3.	$\frac{64^{10}}{16^{15}} = \frac{4^{30}}{4^{30}} = 1$
4.	$\frac{81^4}{27^5} = \frac{3^{16}}{3^{15}} = 3$
5.	$\frac{256}{4^2} = \frac{2^8}{2^4} = 2^4$
6.	$\frac{64^2}{32} = \frac{2^{12}}{2^5} = 2^7$
7.	$\frac{72^2 \times 12^2}{36^2 \times 16} = \frac{(6 \times 12)^2 \times (6 \times 2)^2}{6^4 \times 2^4} = \frac{6^2 \times (6 \times 2)^2 \times (6 \times 2)^2}{6^4 \times 2^4} =$ $\frac{6^2 \times (6 \times 2)^4}{6^4 \times 2^4} = \frac{6^2 \times 6^4 \times 2^4}{6^4 \times 2^4} = 6^2$
8.	$\frac{8^9 \times 16^{10}}{32^9 \times 64^3} = \frac{2^{27} \times 2^{40}}{2^{45} \times 2^{18}} = \frac{2^{67}}{2^{63}} = 2^4$
9.	$\frac{100^3}{25^3} = \frac{10^6}{5^6} = \left(\frac{10}{5}\right)^6 = 2^6$
10.	$\frac{128 \times 48^3}{96^3} = \frac{2^7 \times (3 \times 16)^3}{(32 \times 3)^3} = \frac{2^7 \times 3^3 \times 2^{12}}{2^{15} \times 3^3} = \frac{2^{19}}{2^{15}} = 2^4$
11.	$\frac{90^3}{40 \times 9^2} = \frac{(10 \times 9)^3}{4 \times 10 \times 3^4} = \frac{10^3 \times 3^6}{4 \times 10 \times 3^4} = \frac{1}{4} \times 10^2 \times 3^2 = \frac{30^2}{2^2} = \left(\frac{30}{2}\right)^2 = 15^2$
12.	$\frac{70^3 \times 9}{42^2 \times 25} = \frac{(7 \times 10)^3 \times 3^2}{(6 \times 7)^2 \times 5^2} = \frac{7^3 \times 10^3 \times 3^2}{6^2 \times 7^2 \times 5^2} = \frac{7^3 \times (5 \times 2)^3 \times 3^2}{(2 \times 3)^2 \times 7^2 \times 5^2} =$ $\frac{7^3 \times 5^3 \times 2^3 \times 3^2}{2^2 \times 3^2 \times 7^2 \times 5^2} = 7 \times 5 \times 2 = 70$
13.	$\frac{108 \times 27^2}{18^2} = \frac{36 \times 3 \times 3^6}{(3 \times 6)^2} = \frac{6^2 \times 3^7}{3^2 \times 6^2} = 3^5$
14.	$\frac{98^2 \times 56}{14^3} = \frac{(7 \times 14)^2 \times 7 \times 8}{(7 \times 2)^3} = \frac{7^2 \times 14^2 \times 7 \times 2^3}{7^3 \times 2^3} = \frac{7^3 \times (7 \times 2)^2 \times 2^3}{7^3 \times 2^3} =$ $\frac{7^3 \times 7^2 \times 2^2 \times 2^3}{7^3 \times 2^3} = \frac{7^5 \times 2^5}{7^3 \times 2^3} = \frac{14^5}{14^3} = 14^2$
15.	$\frac{54 \times 18^3}{81 \times 12} = \frac{27 \times 2 \times (9 \times 2)^3}{3^4 \times 4 \times 3} = \frac{3^3 \times 2 \times 9^3 \times 2^3}{3^4 \times 2^2 \times 3} = \frac{3^3 \times 2^4 \times 3^6}{3^5 \times 2^2} = \frac{3^9 \times 2^4}{3^5 \times 2^2} =$ $3^4 \times 2^2 = 9^2 \times 2^2 = 18^2$

הצג את המספרים כחזקות של בסיסים ראשוניים:

1.	$12 =$	18.	$125 =$
2.	$27^3 =$	19.	$60^4 =$
3.	$36 =$	20.	$120 =$
4.	$40^4 =$	21.	$180 =$
5.	$54 =$	22.	$150^2 =$
6.	$64 =$	23.	$128 =$
7.	$80 =$	24.	$112^2 =$
8.	$18^4 =$	25.	$144 =$
9.	$50 =$	26.	$196 =$
10.	$72 =$	27.	$200^3 =$
11.	$32^3 =$	28.	$250 =$
12.	$48 =$	29.	$240 =$
13.	$81 =$	30.	$126^4 =$
14.	$75^2 =$	31.	$288 =$
15.	$90 =$	32.	$245 =$
16.	$96^2 =$	33.	$84^5 =$
17.	$108 =$	34.	$400 =$

הצג את המספרים כחזקות של בסיסים ראשוניים - תשובות:

1.	$12 = 3 \times 4 = 3 \times 2^2$	18.	$125 = 5^3$
2.	$27^3 = 3^9$	19.	$60^4 = 3^4 \times 20^4 = 3^4 \times 5^4 \times 4^4 = 3^4 \times 5^4 \times 2^8$
3.	$36 = 6^2 = 3^2 \times 2^2$	20.	$120 = 40 \times 3 = 8 \times 5 \times 3 = 2^3 \times 5 \times 3$
4.	$40^4 = 10^4 \times 4^4 = 5^4 \times 2^4 \times 2^8 = 5^4 \times 2^{12}$	21.	$180 = 20 \times 9 = 5 \times 4 \times 3^2 = 5 \times 2^2 \times 3^2$
5.	$54 = 27 \times 2 = 3^3 \times 2$	22.	$150^2 = 50^2 \times 3^2 = 25^2 \times 2^2 \times 3^2 = 5^4 \times 2^2 \times 3^2$
6.	$64 = 2^6$	23.	$128 = 2^7$
7.	$80 = 10 \times 8 = 2 \times 5 \times 2^3 = 5 \times 2^4$	24.	$112^2 = 16^2 \times 7^2 = 2^8 \times 7^2$
8.	$18^4 = 2^4 \times 9^4 = 2^4 \times 3^8$	25.	$144 = 12^2 = 6^2 \times 2^2 = 2^2 \times 3^2 \times 2^2 = 2^4 \times 3^2$
9.	$50 = 25 \times 2 = 5^2 \times 2$	26.	$196 = 14^2 = 7^2 \times 2^2$
10.	$72 = 9 \times 8 = 3^2 \times 2^3$	27.	$200^3 = 2^3 \times 100^3 = 2^3 \times 10^6 = 2^3 \times 5^6 \times 2^6 = 2^9 \times 5^6$
11.	$32^3 = 2^{15}$	28.	$250 = 125 \times 2 = 5^3 \times 2$
12.	$48 = 3 \times 16 = 3 \times 2^4$	29.	$240 = 15 \times 16 = 3 \times 5 \times 2^4$
13.	$81 = 3^4$	30.	$126^4 = 3^8 \times 7^4 \times 2^4$
14.	$75^2 = 3^2 \times 25^2 = 3^2 \times 5^4$	31.	$288 = 2 \times 144 = 2 \times 12^2 = 2 \times 4^2 \times 3^2 = 2^5 \times 3^2$
15.	$90 = 9 \times 10 = 3^2 \times 5 \times 2$	32.	$245 = 5 \times 49 = 5 \times 7^2$
16.	$96^2 = 3^2 \times 32^2 = 3^2 \times (2^5)^2 = 3^2 \times 2^{10}$	33.	$84^5 = 21^5 \times 4^5 = 7^5 \times 3^5 \times 2^{10}$
17.	$108 = 27 \times 4 = 3^3 \times 2^2$	34.	$400 = 16 \times 25 = 2^4 \times 5^2$

תרגילי חזקות מסכמים:

1.	$a^{18} \cdot a^2 \div a^4 =$	11.	$\frac{216^2}{\frac{4^3}{3^5}} =$
2.	$x^a \cdot x^b \cdot x^c =$	12.	$\frac{75 \cdot 81}{(3^3)^{\frac{1}{3}} \cdot \left(\frac{1}{15}\right)^{-5}} =$
3.	$\left(\frac{1}{2}\right)^{-2} \cdot \frac{8^2}{16^{-1}} =$	13.	$\frac{(-x)^4 \cdot x^3}{y^{(y^0)} \cdot y^5 \div (y^6)^{-\frac{1}{6}}} =$
4.	$\frac{(y^2 \cdot y^3)^3}{y^{-2}} =$	14.	$\frac{\frac{1}{y^{-7}} \cdot x^6}{(-y)^4 \cdot x^0} =$
5.	$\frac{x^{-7}}{x^{-4}} \cdot x^2 =$	15.	$\frac{x^n \cdot y^n}{(-x)^{2n} \cdot y^{3n}} =$
6.	$\frac{27 \cdot 1^3}{3^0 \cdot \frac{1}{3} \cdot 3^5} =$	16.	$\left\{ \left[\left(\frac{1}{5} \right)^{-n} \right]^m \right\}^x =$
7.	$\frac{16 \cdot 5^4}{\frac{1}{5} \cdot \frac{1}{4^3}} =$	17.	$y^a \div y^b \cdot \left(\left(\frac{1}{y^a} \right)^{-3} \right)^{-2} =$
8.	$\frac{9 \cdot 8}{\left(\frac{1}{3}\right)^{-2} \cdot 2^6} =$	18.	$\frac{x^3 \cdot y^2}{\left(\frac{y}{x}\right)^{-3} \cdot y^5} + 3 =$
9.	$\frac{x^3 \cdot c^{-10} \cdot a^{-1}}{c \cdot x^2 \cdot a^4} =$	19.	$\left[\frac{(a^{-2} \cdot b^3)^2}{(ab)^{-y}} \right]^{-2} =$
10.	$\frac{10^9 \cdot 1000}{125^4} =$	20.	$5^{10} \cdot 10^{20} \div 20^{30} =$

תרגילי חזקות מסכמים – תשובות:

1.	$a^{18} \cdot a^2 \div a^4 = \frac{a^{18+2}}{a^4} = \frac{a^{20}}{a^4} = a^{20-4} = a^{16}$	11.	$\frac{216^2}{4^3} = \frac{(6^3)^2}{2^6} = \frac{6^6}{2^6} = \frac{2^6 \times 3^6}{2^6} \times \frac{1}{3^5} = \frac{3^6}{3^5} = 3$
2.	$x^a \cdot x^b \cdot x^c = x^{a+b+c}$	12.	$\frac{75 \cdot 81}{(3^3)^{\frac{1}{3}} \cdot \left(\frac{1}{15}\right)^{-5}} = \frac{25 \cdot 3 \cdot 9^2}{3^{3 \cdot \left(\frac{1}{3}\right)} \cdot 15^5} = \frac{5^2 \cdot 3 \cdot 3^{2 \cdot 2}}{3^{-1} \cdot (5 \cdot 3)^5} =$ $\frac{5^2 \cdot 3^{1+4}}{3^{-1} \cdot 3^5 \cdot 5^5} = \frac{5^2 \cdot 3^5}{5^5 \cdot 3^{-1+5}} = \frac{5^2 \cdot 3^5}{5^5 \cdot 3^4} = 5^{2-5} \cdot 3^{5-4} =$ $5^{-3} \cdot 3 = \frac{1}{5^3} \cdot 3 = \frac{3}{5^3}$
3.	$\left(\frac{1}{2}\right)^{-2} \cdot \frac{8^2}{16^{-1}} = \frac{2^2 \cdot (2^3)^2}{(2^4)^{-1}} = \frac{2^2 \cdot 2^6}{2^{-4}} =$ $\frac{2^8}{2^{-4}} = 2^{8-(-4)} = 2^{12}$	13.	$\frac{(-x)^4 \cdot x^3}{y^{(y^0)} \cdot y^5 \div (y^6)^{-\frac{1}{6}}} = \frac{x^4 \cdot x^3}{y \cdot y^5 \div y^{-1}} = \frac{x^{4+3}}{\frac{y^{1+5}}{y^{-1}}} =$ $\frac{x^7}{\frac{y^6}{y}} = \frac{x^7}{y^{6+1}} = \frac{x^7}{y^7} = \left(\frac{x}{y}\right)^7$ $\frac{1}{y}$
4.	$\frac{(y^2 \cdot y^3)^3}{y^{-2}} = \frac{(y^{2+3})^3}{y^{-2}} = \frac{(y^5)^3}{y^{-2}} = \frac{y^{15}}{y^{-2}} = y^{17}$	14.	$\frac{\frac{1}{y^{-7}} \cdot x^6}{(-y)^4 \cdot x^0} = \frac{y^7 \cdot x^6}{y^4 \cdot 1} = y^{7-4} \cdot x^6 =$ $y^3 \cdot (x^2)^3 = (y \cdot x^2)^3$
5.	$\frac{x^{-7}}{x^{-4}} \cdot x^2 = x^{-7-(-4)} \cdot x^2 = x^{-3} \cdot x^2 = x^{-1} = \frac{1}{x}$	15.	$\frac{x^n \cdot y^n}{(-x)^{2n} \cdot y^{3n}} = \frac{(x \cdot y)^n}{(x^2)^n \cdot (y^3)^n} = \frac{(x \cdot y)^n}{(x^2 \cdot y^3)^n} =$ $\left(\frac{x \cdot y}{x^2 \cdot y^3}\right)^n = (x^{1-2} \cdot y^{1-3})^n = (x^{-1} \cdot y^{-2})^n$
6.	$\frac{27 \cdot 1^3}{3^0 \cdot \frac{1}{3} \cdot 3^5} = \frac{3^3}{1 \cdot 3^{-1} \cdot 3^5} = \frac{3^3}{3^{5-1}} = \frac{3^3}{3^4} = 3^{-1} = \frac{1}{3}$	16.	$\left\{ \left[\left(\frac{1}{5} \right)^{-n} \right]^m \right\}^x = 5^{nmx}$
7.	$\frac{16 \cdot 5^4}{\frac{1}{5} \cdot \frac{1}{4^3}} = \frac{4^2 \cdot 5^4}{5^{-1} \cdot 4^{-3}} = 4^{2-(-3)} \cdot 5^{4-(-1)} = 4^5 \times 5^5 =$ $(4 \cdot 5)^5 = 20^5$	17.	$y^a \div y^b \cdot \left(\left(\frac{1}{y^a} \right)^{-3} \right)^{-2} = \frac{y^a}{y^b} \cdot \left[(y^a)^3 \right]^{-2} =$ $y^{a-b} \cdot (y^{3a})^{-2} = y^{a-b} \cdot y^{-6a} = y^{-5a-b}$

<p>8.</p>	$\frac{9 \cdot 8}{\left(\frac{1}{3}\right)^{-2} \cdot 2^6} = \frac{3^2 \cdot 2^3}{3^2 \cdot 2^6} = 2^{3-6} = 2^{-3} = \frac{1}{2^3} = \frac{1}{8}$	<p>18.</p> $\frac{x^3 \cdot y^2}{\left(\frac{y}{x}\right)^{-3} \cdot y^5} + 3 = \frac{x^3 \cdot y^2}{\frac{x^3}{y^3} \cdot y^5} + 3 = \frac{x^3 \cdot y^2}{x^3 \cdot y^{5-3}} + 3 =$ $\frac{x^3 \cdot y^2}{x^3 \cdot y^2} + 3 = 4$
<p>9.</p>	$\frac{x^3 \cdot c^{-10} \cdot a^{-1}}{c \cdot x^2 \cdot a^4} = \frac{x^3}{x^2} \cdot \frac{c^{-10}}{c} \cdot \frac{a^{-1}}{a^4} = x^{3-2} \cdot c^{-10-1} \cdot a^{-1-4} =$ $x \cdot c^{-11} \cdot a^{-5} = \frac{x}{c^{11} \cdot a^5}$	<p>19.</p> $\left[\frac{(a^{-2} \cdot b^3)^2}{(ab)^{-y}} \right]^{-2} = \left[\frac{a^{-4} \cdot b^6}{a^{-y} \cdot b^{-y}} \right]^{-2} = (a^{-4-(-y)} \cdot b^{6-(-y)})^{-2} =$ $(a^{y-4} \cdot b^{6+y})^{-2} = \frac{1}{(a^{y-4} \cdot b^{6+y})^2} = \frac{1}{a^{2y-8} \cdot b^{12+2y}}$
<p>10.</p>	$\frac{10^9 \cdot 1000}{125^4} = \frac{10^9 \cdot 10^3}{(5^3)^4} = \frac{10^{9+3}}{5^{3 \cdot 4}} = \frac{10^{12}}{5^{12}} = \left(\frac{10}{5}\right)^{12} =$ 2^{12}	<p>20.</p> $5^{10} \cdot 10^{20} \div 20^{30} = \frac{5^{10} \cdot (5 \cdot 2)^{20}}{(5 \cdot 4)^{30}} = \frac{5^{10} \cdot 5^{20} \cdot 2^{20}}{5^{30} \cdot 4^{30}} =$ $\frac{5^{30} \cdot 2^{20}}{5^{30} \cdot 2^{60}} = \frac{5^{30} \cdot 2^{20}}{5^{30} \cdot 2^{60}} = 1 \cdot 2^{20-60} = 2^{-40} = \frac{1}{2^{40}}$