

## Equacions trigonomètriques

- 1.-  $\cos 5x + \cos x + 2\cos 3x \cdot \sin 2x = 12 \cos 3x$  . *Selectivitat russa 1971 1.1.*
- 2.-  $\cos 2x + 4 \sin x \cdot \cos^2 2x - 2 \sin x \cdot \cos 4x = 0$  . *Selectivitat russa 1971 2.1.*
- 3.-  $\cos 3x \cdot \sin x + 2\cos^2\left(\frac{\pi}{4} - x\right) = 1$  . *Selectivitat russa 1972 1.1.*
- 4.-  $\cos\frac{3x}{2} - \cos\frac{x}{2} = 3(1 + \cos x)$  . *Selectivitat russa 1972 2.1.*
- 5.-  $2 \sin x + \cos 2x = 1$  . *Selectivitat russa 1973 1.1.*
- 6.-  $2 \cos x - \operatorname{ctgx} = 0$  . *Selectivitat russa 1973 2.1.*
- 7.-  $\frac{\operatorname{ctgx}}{\cos 2x} = 2 + \operatorname{tg}2x$  . *Selectivitat russa 1974 1.1.*
- 8.-  $\operatorname{ctg}\left(x + \frac{5\pi}{4}\right) = \operatorname{ctgx} - 1$  . *Selectivitat russa 1974 2.1.*
- 9.-  $\sin(x + 7) + \sin(3x - 1) = \cos(x - 4)$  . *Selectivitat russa 1975 1.1.*
- 10.-  $2 \sin(2x - 3) \cdot \cos(x + 1) - \sin(3x - 2) = 0$  . *Selectivitat russa 1975 2.1.*
- 11.-  $1 - 2\sqrt{2} \cos^3 3x + \cos 6x = 0$  . *Selectivitat russa 1976 1.1.*
- 12.-  $16 \cos^5 2x - \cos 4x = 1$  . *Selectivitat russa 1976 2.1.*
- 13.-  $\cos^2 x = \frac{1}{4}$  . *Selectivitat russa 1977 1.1.*
- 14.-  $\operatorname{ctg}^2 x = 3$  . *Selectivitat russa 1977 2.1.*
- 15.-  $3 \cos x + 2 \sin 2x = 0$  . *Selectivitat russa 1978 1.1.*
- 16.-  $2 \sin x + 3 \cos 2x - 3 = 0$  . *Selectivitat russa 1978 2.1.*
- 17.-  $\cos\frac{x}{3} = \cos\frac{x}{6} - 1$  . *Selectivitat russa 1979 1.1.*
- 18.-  $2 \sin\frac{x}{2} = 1 - \cos x$  . *Selectivitat russa 1979 2.1.*
- 19.-  $\sin x \cdot \cos\frac{\pi}{7} - \cos x \cdot \sin\frac{\pi}{7} = -\frac{1}{2}$  . *Selectivitat russa 1980 1.1.*

20.-  $\cos x \cdot \cos \frac{\pi}{8} - \sin x \cdot \sin \frac{\pi}{8} = -\frac{1}{2}$ . *Selectivitat russa 1980 2.1.*

21.-  $\cos(50^\circ - x) \cdot \cos(40^\circ + x) = \frac{1}{4}$ . *Selectivitat russa 1981 1.1.*

22.-  $\sin\left(\frac{\pi}{3} + x\right) + \sin\left(\frac{7\pi}{12} - x\right) = 0$ . *Selectivitat russa 1981 2.1.*

23.-  $\cos x + \sqrt{17} \cos \frac{x}{2} = 0$ . *Selectivitat russa 1982 1.1.*

24.-  $8 \sin 4x - \sqrt{8} \cos 8x = 0$ . *Selectivitat russa 1982 2.1.*

25.-  $\sin 7x - \sin 3x = \sin 2x$ . *Selectivitat russa 1983 1.1.*

26.-  $\cos 3x - \cos 5x = \sin x$ . *Selectivitat russa 1983 2.1.*

27.-  $\frac{\cos x}{3 + \sin x} - \operatorname{tg} x = 0$ . *Selectivitat russa 1984 1.1.*

28.-  $\frac{3 \sin x}{3 \cos x - 4} - \operatorname{ctg} x = 0$ . *Selectivitat russa 1984 2.1.*

29.-  $6 \cos^2 \frac{x}{4} = \cos x + 5$ . *Selectivitat russa 1985 1.1.*

30.-  $\cos 4x + 6 \sin^2 x = 1$ . *Selectivitat russa 1985 2.1.*

31.-  $4 \sin x + \cos 2x + 3 = 0$ . *Selectivitat russa 1988 1.1.*

32.-  $8 \cos x = 5 + \cos 2x$ . *Selectivitat russa 1988 2.1.*

33.-  $\cos 5x + \cos x = \sqrt{5} \cos 2x$ . *Selectivitat russa 1989 1.1.*

34.-  $\sin 5x - \sin x = \sqrt{8} \cos 3x$ . *Selectivitat russa 1989 2.1.*

35.-  $\cos 3x \cdot \sin x = \sin 4x$ . *Selectivitat russa 1990 1.3.*

36.-  $\sin 2x \cdot \cos 3x = \sin 5x$ . *Selectivitat russa 1990 2.3.*

37.-  $8 - \sin 2x = 9 \sin^2 x$ . *Selectivitat russa 1991 1.1.*

38.-  $14 \cos^2 x - 9 \sin 2x = 4$ . *Selectivitat russa 1991 2.1.*

39.-  $2 - \cos 2x = 3 \sin x$ . *Selectivitat russa 1992 1.1.*

40.-  $3 \cos x - \cos 2x = 2$ . *Selectivitat russa 1992 2.1.*

- 41.-  $10 \sin^2 \frac{x}{2} + 3 \sin x - 5 = 0$  . *Selectivitat russa 1993 1.2.*
- 42.-  $4 \cos^2 \frac{x}{2} - 5 \sin x - 2 = 0$  . *Selectivitat russa 1993 2.2.*
- 43.-  $\cos(7 - x) = \cos 7x$  . *Selectivitat russa 1993 3.2.*
- 44.-  $\sin 6x = \sin(6 - x)$  . *Selectivitat russa 1993 4.2.*
- 45.-  $\sin 2x \cdot \sin 6x = \frac{1}{2}$  . *Selectivitat russa 1994 1.1.*
- 46.-  $\cos^2 2x + \cos^2 5x = 1$  . *Selectivitat russa 1994 2.1.*
- 47.-  $3 \cos x + 5 \sin x = 5$  . *Selectivitat russa 1994 3.2.*
- 48.-  $4 \sin x - \cos x = 4$  . *Selectivitat russa 1994 4.2.*
- 49.-  $\cos 2x - 1 = \operatorname{tg} x$  . *Selectivitat russa 1995 1.1.*
- 50.-  $1 + \cos x = \operatorname{ctg}\left(\frac{x}{2}\right)$  . *Selectivitat russa 1995 2.1.*
- 51.-  $\sin 5x + \sin x = \sin 3x$  . *Selectivitat russa 1995 5.1.*
- 52.-  $\cos 5x - \cos 7x = \sin 6x$  . *Selectivitat russa 1995 6.1.*
- 53.-  $1 - \cos 3x = \sin 3x$  . *Selectivitat russa 1996 1.1.*
- 54.-  $\sqrt{3}(1 + \cos 2x) = \sin 2x$  . *Selectivitat russa 1996 2.1.*
- 55.-  $\cos 2x + 8 \sin x = 3$  . *Selectivitat russa 1996 3.1.*
- 56.-  $1 + 4 \cos x = \cos 2x$  . *Selectivitat russa 1996 4.1.*
- 57.-  $\cos 3x - \sin\left(7x + \frac{\pi}{2}\right) = \sin 2x$  . *Selectivitat russa 1996 5.1.*
- 58.-  $\cos\left(5x - \frac{\pi}{2}\right) + \sin 3x = \cos x$  . *Selectivitat russa 1996 6.1.*
- 59.-  $\sin x - \sin 3x = 4 \sin^2 x \cdot \cos x$  . *Selectivitat russa 1997 1.1.*
- 60.-  $\cos x - \cos 3x = 4 \sin^3 x$  . *Selectivitat russa 1997 2.1.*
- 61.-  $\cos 2x + \cos 6x = -\sqrt{3} \cos 4x$  . *Selectivitat russa 1997 3.1.*
- 62.-  $\sin 9x - \sin 5x = \sqrt{3} \cos 7x$  . *Selectivitat russa 1997 4.1.*

- 63.-  $\cos 6x + 6 \cos 2x = 0$  . *Selectivitat russa 1997 5.1.*
- 64.-  $\sin 3x - 7 \sin x = 0$  . *Selectivitat russa 1997 6.1.*
- 65.-  $\sin 3x - \cos 2x \cdot \sin x = 0$  . *Selectivitat russa 1998 1.1.*
- 66.-  $\cos 2x \cdot \cos 3x - \cos 5x = 0$  . *Selectivitat russa 1998 2.1.*
- 67.-  $\cos 5x - \sin 2x \cdot \cos 3x + \cos x = 0$  . *Selectivitat russa 1998 3.1.*
- 68.-  $\sin 4x - \sin 3x \cdot \sin x + \sin 2x = 0$  . *Selectivitat russa 1998 4.1.*
- 69.-  $4 \cos x \cdot \sin 3x \cdot \cos 4x + \sin 2x = 0$  . *Selectivitat russa 1998 5.1.*
- 70.-  $\sin 2x = 4 \cos 4x \cdot \cos 3x \cdot \sin x$  . *Selectivitat russa 1998 6.1.*
- 71.-  $\sin 6x = \cos 5x + \sin 4x$  . *Selectivitat russa 1999 1.1.*
- 72.-  $\cos 12x = \sin 5x + \cos 2x$  . *Selectivitat russa 1999 2.1.*
- 73.-  $\cos x - \sin \frac{3x}{2} \cdot \sin \frac{x}{2} = 0$  . *Selectivitat russa 1999 3.1.*
- 74.-  $\sin 2x - \sin \frac{5x}{4} \cdot \cos \frac{3x}{4} = 0$  . *Selectivitat russa 1999 4.1.*
- 75.-  $\cos 9x + \cos 5x + 2 \sin^2 x = 1$  . *Selectivitat russa 1999 5.1.*
- 76.-  $\sin 5x - \sin x + 1 = 2 \cos^2 \frac{3x}{2}$  . *Selectivitat russa 1999 6.1.*
- 77.-  $\sin 3x + \sin 4x = \sin 7x$  . *Selectivitat russa 2000 1.1.*
- 78.-  $\sin 3x - \sin 2x = \sin 5x$  . *Selectivitat russa 2000 2.1.*
- 79.-  $\frac{\cos 6x}{\cos 2x} - 6 \cos 2x + 1 = 0$  . *Selectivitat russa 2000 3.1.*
- 80.-  $\frac{\cos 3x}{\cos x} + 4 \sin x + 1 = 0$  . *Selectivitat russa 2000 4.1.*
- 81.-  $5 \sin 6x + \frac{2}{\cos 2x} = 5 \sin 2x$  . *Selectivitat russa 2000 5.1.*
- 82.-  $\frac{1}{\sin 2x} - 5 \cos 6x = 5 \cos 2x$  . *Selectivitat russa 2000 6.1.*
- 83.-  $2 \sin(3x^2) \cdot \cos 4x + \sin(4x - 3x^2) = 0$  . *Selectivitat russa 2001 1.2.*
- 84.-  $2 \sin 3x \cdot \sin(4x^2) + \cos(4x^2 + 3x) = 0$  . *Selectivitat russa 2001 2.2.*

- 85.-  $\sin 5x = \frac{\sqrt{3}}{2} \sin x - \frac{1}{2} \cos x$  . *Selectivitat russa 2001 3.1.*
- 86.-  $\cos 3x = \frac{1}{2} \cos x + \frac{\sqrt{3}}{2} \sin x$  . *Selectivitat russa 2001 4.1.*
- 87.-  $\operatorname{tg}(2x + 5) \cdot \operatorname{ctg}(x + 2) = 1$  . *Selectivitat russa 2001 5.1.*
- 88.-  $\operatorname{tg}(3x + 4) \cdot \operatorname{ctg}(7 - x) = 1$  . *Selectivitat russa 2001 6.1.*
- 89.-  $2 \cos^2 2x \cdot \operatorname{tg}(\sin x) - \cos 4x = 1$  . *Selectivitat russa 2002 1.1.*
- 90.-  $2\sqrt{3} \sin^2 6x \cdot \operatorname{tg}(\cos x) + \cos 12x = 1$  . *Selectivitat russa 2002 2.1.*
- 91.-  $2 \cos^2 \frac{3x}{2} - \cos 3x \cdot \operatorname{ctgx} = \operatorname{ctgx}$  . *Selectivitat russa 2002 3.2.*
- 92.-  $2 \cos^2 3x - \cos 6x \cdot \operatorname{tgx} = \operatorname{tgx}$  . *Selectivitat russa 2002 4.2.*
- 93.-  $\cos x - \cos 3x = \frac{1}{2} \operatorname{ctgx}$  . *Selectivitat russa 2002 5.1.*
- 94.-  $\sin 9x + \sin 3x = \frac{3\sqrt{3}}{2} \operatorname{tg} 3x$  . *Selectivitat russa 2002 6.1.*
- 95.-  $\cos 4x + 2 \sin 3x - \cos 2x + \sin x - 1 = 0$  . *Selectivitat russa 2003 1.1.*
- 96.-  $\sin 4x - \sin 3x + \sin 2x - 2 \cos x + 1 = 0$  . *Selectivitat russa 2003 2.1.*
- 97.-  $2 \sin(3 \cos 3x + 6 \sin 2x \cdot \sin x) = 1$  . *Selectivitat russa 2003 3.1.*
- 98.-  $2 \cos(8 \sin 4x \cdot \cos 3x - 4 \sin 7x) + 1 = 0$  . *Selectivitat russa 2003 4.1.*
- 99.-  $\operatorname{tg}^2 x - 2 \cos 2x = 1$  . *Selectivitat russa 2003 5.1.*
- 100.-  $2 \cos 2x + 9 \operatorname{tg}^2 x = 4$  . *Selectivitat russa 2003 6.1.*
- 101.-  $8 \sin\left(x + \frac{3\pi}{8}\right) \cdot \cos \frac{\pi}{8} - 4 \cos x - 3 = 0$  . *Selectivitat russa 2004 1.1.*
- 102.-  $14 \cos\left(x + \frac{3\pi}{10}\right) \cdot \cos \frac{\pi}{5} + 7 \sin x - 4 = 0$  . *Selectivitat russa 2004 2.1.*
- 103.-  $\sin 3x \cdot \sin 2x + \sin 3x \cdot \sin 4x - \cos x = 0$  . *Selectivitat russa 2004 3.1.*
- 104.-  $\cos x \cdot \sin 4x + \cos 2x \cdot \sin 5x - \sin 3x = 0$  . *Selectivitat russa 2004 4.1.*
- 105.-  $8 \cos 8x - 4 \cos^2 2x + 5 = 0$  . *Selectivitat russa 2005 1.1.*

- 106.-  $8 \sin^2 3x + 6 \cos 12x - 3 = 0$  . *Selectivitat russa 2005 2.1.*
- 107.-  $2 \cos 3x \cdot \cos 8x - \cos 6x = 1$  . *Selectivitat russa 2005 3.1.*
- 108.-  $1 - 2 \sin 2x \cdot \sin 5x = \cos 4x$  . *Selectivitat russa 2005 4.1.*
- 109.-  $\sin 5x - \sin x = \sqrt{8} \cos 3x$  . *Selectivitat russa 2006 1.1.*
- 110.-  $\cos 5x + \cos x = \sqrt{5} \cos 2x$  . *Selectivitat russa 2006 2.1.*
- 111.-  $\cos 7x = \frac{3\pi}{2} \cos x - \cos 5x$  . *Selectivitat russa 2006 3.1.*
- 112.-  $\sin 5x = \pi \cos x - \sin 3x$  . *Selectivitat russa 2006 3.1.*