

Сумма синусов:

$$\sin(s + t) + \sin(s - t);$$

$$\sin(s + t) = \sin s \cos t + \cos s \sin t;$$

$$\sin(s - t) = \sin s \cos t - \cos s \sin t;$$

$$\sin(s + t) + \sin(s - t) = (\sin s \cos t + \cos s \sin t) + (\sin s \cos t - \cos s \sin t);$$

$$\sin(s + t) + \sin(s - t) = \sin s \cos t + \cos s \sin t + \sin s \cos t - \cos s \sin t;$$

$$\sin(s + t) + \sin(s - t) = 2 \sin s \cos t;$$

$$x = s + t; \quad y = s - t;$$

$$x + y = s + t + s - t;$$

$$x + y = 2s;$$

$$s = \frac{x+y}{2};$$

$$x - y = s + t - (s - t);$$

$$x - y = s + t - s + t;$$

$$x - y = 2t;$$

$$s = \frac{x+y}{2};$$

$$s = \frac{x+y}{2};$$

$$\sin(x + y) = \sin x \cos y + \cos x \sin y;$$

$$\sin(x - y) = \sin x \cos y - \cos x \sin y;$$

$$s = \frac{x+y}{2}; \quad \mathbf{s} = \frac{\mathbf{x} + \mathbf{y}}{2}; \quad s = \frac{x+y}{2};$$

Разность синусов:

$$\sin x - \sin y = \sin x + \sin(-y);$$

$$s = \frac{x+y}{2};$$

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$$s = \frac{x+y}{2};$$

$$-\sin y = \sin(-y);$$

Пример. Упростить выражение $\sin 77^\circ - \sin 17^\circ$.

Решение.

$$s = \frac{x+y}{2}; \quad S = \frac{x+y}{2}; \quad s = \frac{x+y}{2};$$

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$$S = \frac{x+y}{2}; \quad \blacktriangleleft$$

Сумма косинусов:

$$\cos (s + t) + \cos (s - t);$$

$$\cos (s + t) + \cos (s - t) = \cos s \cos t - \sin s \sin t + \cos s \cos t + \sin s \sin t;$$

$$\cos (s + t) + \cos (s - t) = 2 \cos s \cos t;$$

$$x = s + t; \quad y = s - t;$$

$$s = \frac{x+y}{2}; \quad s = \frac{x+y}{2};$$

$$s = \frac{x+y}{2};$$

$$\cos (x + y) = \cos x \cos y - \sin x \sin y;$$

$$\cos (x - y) = \cos x \cos y + \sin x \sin y;$$

Пример. Упростить выражение $\cos(x + 2y) + \cos(3x - 2y)$.

Решение.

$$\cos(x + 2y) + \cos(3x - 2y) = 2 \cos \frac{x + y}{2};$$

$$2 \cos \frac{x + y}{2}; \quad 2 \cos 2x \cos(-(x - 2y)) = 2 \cos 2x \cos(x - 2y);$$

Ответ: $\cos(x + 2y) + \cos(3x - 2y) = 2 \cos 2x \cos(x - 2y)$. ◀■

$$\cos(-t) = \cos t;$$

Разность косинусов:

$$\cos (s+t) - \cos (s-t);$$

$$\cos (s+t) - \cos (s-t) = \cos s \cos t - \sin s \sin t - \cos s \cos t - \sin s \sin t;$$

$$\cos (s+t) - \cos (s-t) = -2 \sin s \sin t;$$

$$x = s+t; \quad y = s-t;$$

$$s = \frac{x+y}{2}; \quad s = \frac{x+y}{2};$$

$$s = \frac{x+y}{2};$$

$$\cos (x+y) = \cos x \cos y - \sin x \sin y;$$

$$\cos (x-y) = \cos x \cos y + \sin x \sin y;$$

$$s = \frac{x + y}{2};$$

Решение.

$$s = \frac{x+y}{2}; \quad s = \frac{x+y}{2}; \quad s = \frac{x+y}{2}; \quad s = \frac{x+y}{2};$$

$$s = \frac{x+y}{2};$$

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