Worksheet 6a Answers.

1. $\lim_{x \to 0} \frac{\sin 3x}{x} = 3$

2. $\lim_{x \to 0} \frac{\tan 3x}{4x} = \frac{3}{4}$

3. $\lim_{x \to 0} \frac{\sin 4x}{4x^2 - x} = -4$

4. $\lim_{x \to 0} \frac{1 - \cos 2x}{x} = 0$

5. $\lim_{x \to 0} \frac{\tan(3x)\sin(4x)}{\sin(5x)\tan(6x)} = \frac{2}{5}$

6. $\lim_{x \to \pi/4} \left(\frac{\cos x - \sin x}{\pi/4 - x} \right) = \sqrt{2}$

7. $\lim_{x \to 0} \frac{x^2}{1 - \cos x} = 2$

8. $\lim_{x \to 0} \frac{1 - \cos 3x}{(\cos^2 5x - 1)} = \frac{9}{50}$

10. $\lim_{x \to 0} \frac{\tan 4x}{\sin 3x} = \frac{4}{3}$

9. $\lim_{x \to 0} \frac{\sin 3x}{2x} = \frac{3}{2}$

11. $\lim_{x \to 0} \frac{1 - \cos 2x}{4x^2} = \frac{1}{2}$

12. $\lim_{x \to \infty} \frac{x + \sin x}{x + \cos x} = 1$

13. $\lim_{x \to \infty} \left(1 + \cos\left(\frac{1}{x}\right) \right) = 2$

14. $\lim_{x \to 0} \frac{\sin x - \sin x \cos x}{x^2} = 0$

15. $\lim_{x \to 0} (x \cot x) = 1$

16. $\lim_{x \to 0} \dfrac{\sin(\alpha + x) - \sin \alpha}{x} = \cos \alpha$

17. $\lim_{x \to 0} \dfrac{\cos(\alpha + x) - \cos \alpha}{x} = -\sin \alpha$

18. $\lim_{x \to 0} \dfrac{\tan(\alpha + x) - \tan \alpha}{x} = \sec^2 \alpha$