Find the limit:

1. $\displaystyle\lim_{x\to 1^+} \frac{1}{x-1}$

2. $\displaystyle\lim_{x\to 1^-} \frac{1}{x-1}$

3. $\displaystyle\lim_{x\to\infty} \left(x+\sqrt{x^2-4x+1} \right)$

4. $\displaystyle\lim_{x\to -\infty} \left(x+\sqrt{x^2-4x+2} \right)$

5. $\displaystyle\lim_{x\to -\infty} \frac{2x+100}{x^2+3}$

6. $\displaystyle\lim_{x\to\infty} \frac{1-x^2}{3x^2-x-1}$

7. $\displaystyle\lim_{x\to\infty} \frac{x^3-2}{x^2+5}$

8. $\displaystyle\lim_{x\to\infty} \frac{1}{\sqrt{x^2+1}}$

9. $\displaystyle\lim_{x\to\infty} \sqrt{x}$

10. $\displaystyle\lim_{x\to\infty} \frac{\cos x}{x}$

11. $\displaystyle\lim_{x\to 0} \sin\frac{1}{x^2}$

12. $\displaystyle\lim_{x\to\infty} \sin x$

13. $\displaystyle\lim_{x\to -\infty} e^{x^2}$

14. $\displaystyle\lim_{x\to -\infty} e^{x^3}$

15. $\displaystyle\lim_{x\to -\infty} \ln|x|$