Section 1-8 : Improper Integrals

Determine if each of the following integrals converge or diverge. If the integral converges determine its value.

1. $\int_0^\infty (1+2x)\mathbf{e}^{-x}\,dx$

2. $\int_{-\infty}^0 (1+2x)\mathbf{e}^{-x}\,dx$

3. $\int_{-5}^1 \frac{1}{10+2z}\,dz$

4. $\int_1^2 \frac{4w}{\sqrt[3]{w^2-4}}\,dw$

5. $\int_{-\infty}^1 \sqrt{6-y}\,dy$

6. $\int_2^\infty \frac{9}{(1-3z)^4}\,dz$

7. $\int_0^4 \frac{x}{x^2-9}\,dx$

8. $\int_{-\infty}^\infty \frac{6w^3}{\left(w^4+1\right)^2}\,dw$

9. $\int_1^4 \frac{1}{x^2+x-6}\,dx$

10. $\int_{-\infty}^0 \frac{\mathbf{e}^{\frac{1}{x}}}{x^2}\,dx$