

EXERCISES 5.4

In Problems 1 and 2, evaluate the given integral, where the contour C is given in the figure, (a) by using an alternative path of integration and (b) by using Theorem

1. $\int_C (4z - 1) dz$

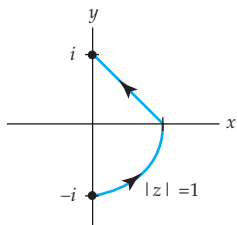


Figure for Problem 1

2. $\int_C e^z dz$

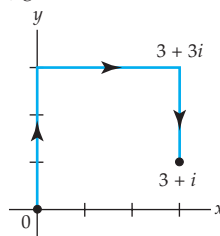


Figure for Problem 2

In Problems 3 and 4, evaluate the given integral along the indicated contour C .

3. $\int_C 2z dz$, where C is $z(t) = 2t^3 + i(t^4 - 4t^3 + 2)$, $-1 \leq t \leq 1$

4. $\int_C 2z dz$, where C is $z(t) = 2\cos^3 \pi t - i\sin^2 \frac{\pi}{4} t$, $0 \leq t \leq 2$

In Problems 5-16, use Theorem to evaluate the given integral. Write each answer in the form $a + ib$.

5. $\int_0^{3+i} z^2 dz$

6. $\int_{-2i}^1 (3z^2 - 4z + 5i) dz$

7. $\int_{1-i}^{1+i} z^3 dz$

8. $\int_{-3i}^{2i} (z^3 - z) dz$

9. $\int_{-i/2}^{1-i} (2z + 1)^2 dz$

10. $\int_1^i (iz + 1)^3 dz$

11. $\int_{i/2}^i e^{\pi z} dz$

12. $\int_{1-i}^{1+2i} ze^{z^2} dz$

13. $\int_{\pi}^{\pi+2i} \sin \frac{z}{2} dz$

14. $\int_{1-2i}^{\pi i} \cos z dz$

15. $\int_{\pi i}^{2\pi i} \cosh z dz$

16. $\int_i^{1+(\pi/2)i} \sinh 3z dz$