EXERCISE – 5.1

STANDARD NORMAL DISTRIBUTION

1. If $Z \sim N(0,1)$. Find

$(a)\ P(Z < 0.87)$ $(b)\ P(Z < 1.42)$

$(c)\ P(Z > 0.82)$ $(d)\ P(Z > 2.58)$

$(e)\ P(Z < -0.65)$ $(f)\ P(Z < -1.32)$

$(g)\ P(Z > -1.43)$ $(h)\ P(Z > -2.37)$

$(Ans: 0.8078,\ 0.9222,\ 0.2061,\ 0.0049,\ 0.2578,\ 0.0934,\ 0.9236,\ 0.9911)$

2. If $Z \sim N(0,1)$. Find

$(a)\ P(1.12 < Z < 1.43)$ $(b)\ P(1.46 < Z < 2.97)$

$(c)\ P(-0.98 < Z < -0.16)$ $(d)\ P(-1.76 < Z < -0.25)$

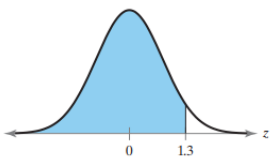
$(e)\ P(-0.20 < Z < 1.56)$ $(f)\ P(-2.46 < Z < 1.74)$

$(g)\ P(|Z| < 1.78)$ $(h)\ P(|Z| > 0.75)$

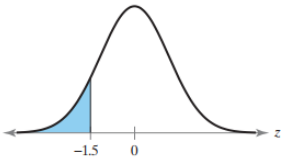
$(Ans: 0.0550,\ 0.0707,\ 0.2729,\ 0.3621,\ 0.5199,\ 0.9521,\ 0.9249,\ 0.4533)$

3. If $Z \sim N(0,1)$. Find the probabilities represented by the shaded areas

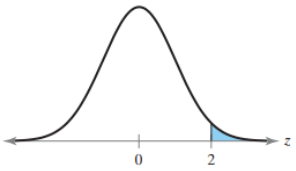
(a)



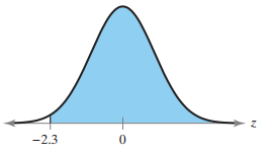
(b)



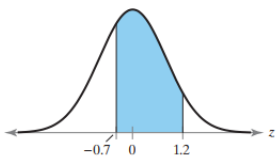
(c)



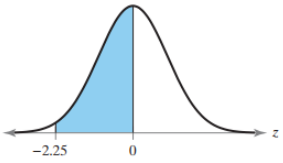
(d)



(e)



(f)



$(Ans: 0.9032,\ 0.0668,\ 0.0228,\ 0.9893,\ 0.6430,\ 0.4878)$

4. If $Z \sim N(0,1)$. Find

a. $P(0.00 < z < 0.74)$ b. $P(-1.17 < z < 1.94)$

c. $P(z > 1.25)$ d. $P(z < 1.75)$

$(Ans: 0.2703,\ 0.8528,\ 0.1056,\ 0.9599)$

5. If $Z \sim N(0,1)$. Find

a. $P(-3.05 < z < 0.00)$ b. $P(-2.43 < z < 1.37)$

c. $P(z < -2.17)$ d. $P(z > 2.43)$

$(Ans: 0.4989,\ 0.9071,\ 0.015,\ 0.0075)$

For Exercises 6 through 25, Find the area under the standard normal distribution curve.

6. Between $z = 0$ and $z = 1.77$ 0.4616

7. Between $z = 0$ and $z = 0.75$ 0.2734

8. Between $z = 0$ and $z = -0.32$ 0.1255

9. Between $z = 0$ and $z = -2.07$ 0.4808

10. To the right of $z = 2.01$ 0.0222

11. To the right of $z = 0.29$ 0.3859

12. To the left of $z = -0.75$ 0.2266

13. To the left of $z = -1.39$ 0.0823

14. Between $z = 1.23$ and $z = 1.90$ 0.0806

15. Between $z = 1.05$ and $z = 1.78$ 0.1094

16. Between $z = -0.96$ and $z = -0.36$ 0.1909

17. Between $z = -1.56$ and $z = -1.83$ 0.0258

18. Between $z = 0.24$ and $z = -1.12$ 0.4634

19. Between $z = -1.46$ and $z = -1.98$ 0.0482

20. To the left of $z = 1.31$ 0.9049

21. To the left of $z = 2.11$ 0.9826

22. To the right of $z = -1.92$ 0.9726

23. To the right of $z = -0.17$ 0.5675

24. To the left of $z = -2.15$ and to the right of $z = 1.62$
0.0684

25. To the right of $z = 1.92$ and to the left of $z = -0.44$
0.3574

EXERCISE – 5.2

GENERAL NORMAL DISTRIBUTION

1. If the random variable x is normally distributed with mean $\mu = 174$ and standard deviation $\sigma = 20$. Find the indicated probability

$(a)\, P(X < 180)$ $(b)\, P(X < 160)$

$(c)\, P(X > 185)$ $(d)\, P(X > 170)$

$(e)\, P(170 < X < 195)$ $(f)\, P(155 < X < 172)$

$(Ans: 0.8078,\ 0.9222, 0.2061,\ 0.0049,\ 0.2578, 0.0934)$

2. The random variable X is normally distributed such that $X \sim N(50, 20)$. Find

(a) $P(X > 60.3)$

(b) $P(X < 59.8)$

(c) $P(45 < X < 60)$

$(Ans: 0.0106, 0.9857, \_\_\_\_\_)$

3. The random variable X is normally distributed such that $X \sim N(-8, 12)$. Find

(a) $P(X < -9.8)$

(b) $P(X > -8.2)$

(c) $P(-7 < X < 0.5)$

$(Ans: 0.3015, 0.5231, 0.3792)$

4. The random variable X is normally distributed such that $X \sim N(100, 81)$. Find

(a) $P(|X - 100| < 18)$

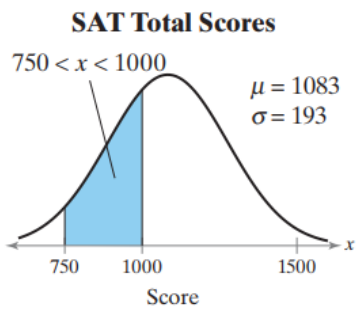
(b) $P(|X - 100| > 5)$

(c) $P(12 < X - 100 < 15)$

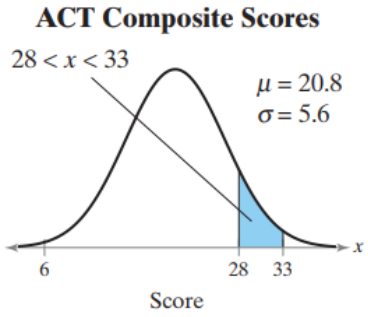
$(Ans: 0.9544, 0.5784, 0.0435)$

5. Assume the variable x is normally distributed. Find the probability of the shaded region of the graph.

(a)



(b)



$(Ans: 0.9544, 0.5784, 0.0435)$