

For #1-2, Z denotes the standard normal random variable.

1. Find $\Pr(Z \geq 2.5)$

- a) 0.0124 b) 0.9938 c) 2.5
d) 0.4938 e) 0.0062

2. Find $\Pr(-1 \leq Z \leq 1.5)$.

- a) 0.7745 b) 0.9932 c) 1.0919
d) 0.2245 e) 0.4932

For #3-5, X denotes the normal random variable with $\mu = 4$ and $\sigma = 2$.

3. Find $\Pr(X \leq 8)$

- a) 0.0028 b) 0.4972 c) 1.0000
d) 0.9772 e) 0.0228

4. Find $\Pr(X \geq 0)$

a) 0.0028

b) 0.5000

c) 0.9772

d) 1.0000

e) 0.6015

5. Find $\Pr(1 \leq X \leq 5)$

a) 0.6915

b) 0.6247

c) 0.7588

d) 0.1587

e) 0.3758

6. SAT scores in Terra America are distributed normally with a mean of 900 and a standard deviation of 100. The TACAA has a rule that no high school senior can be awarded an athletic scholarship unless she/he has an SAT score of at least 700. Under this rule, what percent of high school seniors are **ineligible** for athletic scholarships?

a) 1.14%

b) 97.72%

c) 100%

d) 50%

e) 2.28%

7. Northworst Airlines has discovered that the lateness of its flights is normally distributed with standard deviation 10 minutes. (A flight that arrives 5 minutes early is considered -5 minutes late). Northworst can change the average lateness by adjusting the schedule -- note that this does not change the standard deviation. What should the average lateness (in minutes) be so that at most 5% of Northworst's flights are more than 15 minutes late?

- a) -1.5 b) 1.5 c) - 41
d) -14.75 e) 3.15

8. United Distress has found that the lateness of its flights is normally distributed with mean 30 minutes late and standard deviation 20 minutes. (A flight that arrives 5 minutes early is considered -5 minutes late.) What is the probability that a United Distress plane is actually on time? (That is, at most 0 minutes late)

- a) 0.9394 b) 0.9332 c) 0.0668
d) 0.0334 e) 0.4332

9. A certain class takes a 25 question multiple choice test. Each question has 5 possible answers, of which only one is correct. Use an approximating normal curve to estimate the probability that a person who guesses randomly on every question will get **at least** 10 questions correct.

- a) 0.0122 b) $C(25,10)\left(\frac{1}{5}\right)^{10}\left(\frac{4}{5}\right)^{15}$ c) 0.1056
d) 10/25 e) 0.0062

10. Two lines are in the xy plane and the number of points common to both lines is discovered. Which of the following numbers cannot describe the exact number of points of intersection?

- a) infinitely many b) 0 c) 1 d) 3

11. The entry in the first row and second column of the inverse of $T = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ is

- a) - 2 b) $2/10$ c) - $2/10$
d) - $2/14$ e) T has no inverse

12. Find the y -intercept of the line through the points (6,7) and (2, 5).

- a) 1 b) 4 c) - 8
d) $1/2$ e) 5

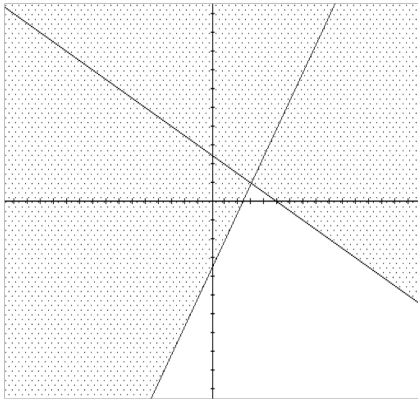
13. Which of the following points satisfies $x + 2y \leq 5$?

- a) (10, -1) b) (2, 3) c) (3, 2)
d) (-1, 5) e) (1, 2)

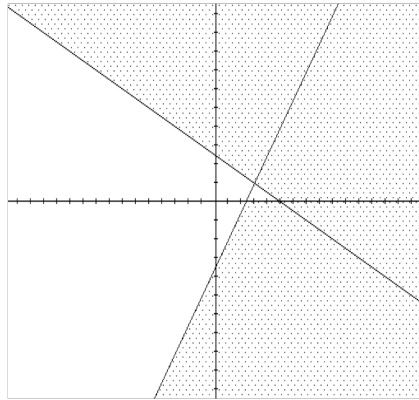
14. Which of the following graphs is the graph of

$$\begin{aligned}x + 2y &\leq 5 \\ 3x - 2y &\geq 7\end{aligned}$$

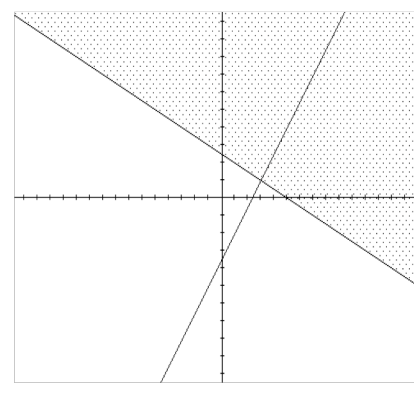
(Note: The **unshaded** region of the graph is the feasible set.)



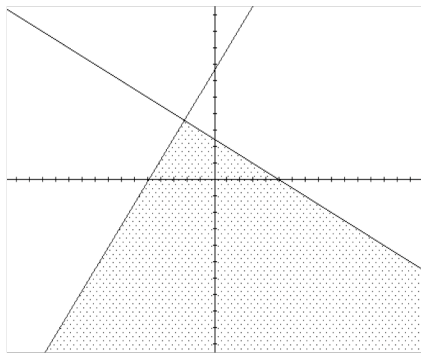
a)



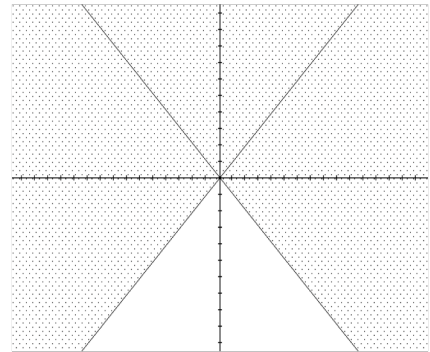
b)



c)



d)



e)

15. Which of the following is not an elementary row operation?

- a) multiplying a row by 3
- b) interchanging two rows
- c) subtracting 1 from each element of a row
- d) adding 5 times one row to another row.
- e) subtracting one row from another row

16. Find z-coordinate of the solution of:

$$\begin{aligned}x + 2y + 3z &= 14 \\2x + y &= 4 \\2y + z &= 7\end{aligned}$$

- a) 0
- b) 2
- c) 1
- d) 3
- e) there is no solution

17. Find the z coordinate of the solution of:

$$\begin{aligned}x + 2y - z &= 3 \\3x + 8y + z &= 7 \\2x + 5y &= 8.\end{aligned}$$

- a) z can be anything
- b) there is no solution
- c) 4
- d) 3
- e) 1

18. The equation of the line through (1, 2) with slope -5 is:

a) $y = (-x + 11)/5$

b) $y = -5x - 5$

c) $y = -5x + 7$

d) $y = -5x + 11$

e) $y = 2x - 5$

19. Multiply: $\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix} \begin{bmatrix} 2 & 1 \\ 4 & 2 \end{bmatrix}$

a) The matrices cannot be multiplied

b) $\begin{bmatrix} 7 & 8 \\ 14 & 16 \end{bmatrix}$

c) $\begin{bmatrix} 6 & 2 \\ 4 & 8 \end{bmatrix}$

d) $\begin{bmatrix} 5 & 3 \\ 5 & 6 \end{bmatrix}$

e) $\begin{bmatrix} 14 & 7 \\ 18 & 9 \end{bmatrix}$

20. Add: $\begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix} + \begin{bmatrix} 2 & 1 \\ 4 & 2 \end{bmatrix}$

a) $\begin{bmatrix} 6 & 2 \\ 4 & 8 \end{bmatrix}$

b) $\begin{bmatrix} 14 & 7 \\ 18 & 9 \end{bmatrix}$

c) $\begin{bmatrix} 7 & 8 \\ 14 & 16 \end{bmatrix}$

d) $\begin{bmatrix} 5 & 3 \\ 5 & 6 \end{bmatrix}$

e) The matrices cannot be added.