1. A normal curve with mean 9 and variance 25 has
   
   b) the area to the right of 25 equal to what? → _______
   
   c) the inflection points of such a curve occur at ________ and ________
   
   d) at what value of x is the area to the left of the number 0.9920. ________

2. A standard normal curve has mean __________

3. If a normal curve has inflection points at 40 and 60, has a variance equal to ________

4. Find the area to the right of 3 under a standard normal curve __________

5. Given a set of data that is normally distributed – mean = 20 and variance = 9,
   find the area to the right of 27. __________

7. A box of 200 pencils is opened. The company that produces the pencils advises you that 2% of all pencils produced by the company will be defective.
   
   How many pencils do you expect to be defective? ________
   
   What is the probability that 4 will be defective? ________
   
   What is the probability that more than 4 will be defective? (Solve by approximating with a normal curve) ________
9. Find the standard deviation of the following r. v. 

<table>
<thead>
<tr>
<th>X = x</th>
<th>P( X = x )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>1/12</td>
</tr>
<tr>
<td>1</td>
<td>5/12</td>
</tr>
<tr>
<td>2</td>
<td>1/2</td>
</tr>
</tbody>
</table>

Write answer in fraction form. ____________

10. Draw a histogram of the r.v. from #9.

11. An eight-sided die is rolled. The sides are labeled as 1, 1, 1, 1, 2, 2, 2, 3. Let the r.v. X represent the value of the outcome.

Write down all the possible values of X. ______________

What is the expected value of X? ______________

12. A game is played as follows;
- a red ace is drawn – you win $30 plus you get your $3 back
- any other ace: you win $10 (plus your $3 bet)
- any other card – you lose your $3.

From the dealers viewpoint – what is the expected value? ______________

If you as a player played this game 100 times, then how much would you expect to wind up winning (or losing)? _____
13. An insurance company currently sells $80,000 at a cost of $600 per year. It is known that there is a 0.1% chance that a person in this category will die within the year. What is the expected value of this policy?

15. Find
   a) $f(2)$ if $f(x) = 2x - 3 - x^2$
   
   b) the y-intercept of the function represented by $g(x) = x^2 + 9x - 7$
   
   c) the x-intercept of $g(x) = x^2 + 9x - 10$

16. Find the domain of each function
   a) $f(x) = \log_2(x - 3)$ (HINT: domain of $\log x$ is $x > 0$)
   
   b) $g(x) = \frac{x + 2}{x^2 - 9}$

17. Find the range of each function
   a) diagram showing a function with range: __________

   b) $f(x) = x^2 - 4x + 1$ range: ________________
18. Sketch the graph of (rough but accurate)
   a) \( y = |2x + 2| \)                  b) \( f(x) = x^2 - 4x + 1 \)
   c) \( 2x - y = 3 \)                  d) \( y = 4^x \)

20. Given \( f(x) = 2x^2 + x + 1 \) find
   a) the slope of the secant line that connects the points at \( x = -2 \) and \( x = 4 \).

   b) \( \lim_{x \to 2} (2x^2 + 1) = \) ____________

21. Find the value of the following limits.
   a) \( \lim_{x \to 2} \frac{x}{x - 2} = \) ________
   b) \( \lim_{x \to -1} \frac{x}{x + 1} = \) ________
22. More limits

a) \( \lim_{x \to -1} (2 - 3x + x^2) = \) ________

b) \( \lim_{x \to \infty} \frac{4x}{x - 3} = \) ________

c) \( \lim_{x \to 2} f(x) = \) ________, if \( f(x) = \frac{x - 2}{x^2 - 3x + 2} \)

d) \( \lim_{x \to \infty} \frac{2x^2}{x^3 + 1} = \) ________

e) \( \lim_{x \to 5} -3 = \) ________

f) \( \lim_{h \to 0} (x + 2h + 3) = \) ________

g) \( \lim_{h \to 0} \frac{f(x + h) - f(x)}{h} = \) ________, if \( f(x) = 2 - 4x \)

23. Describe in short - definition what we mean by the derivative of a function.

24. What does the following expression represent?

\[ \lim_{h \to 0} \frac{f(x + h) - f(x)}{h} \]

25. We say that a function is ________________________ at \( x = 2 \) provided

a) \( f(2) \) exists

b) \( \lim_{x \to 2} f(x) \) exists and

c) the answer from \#1 = the answer from \#2 \( \lim_{x \to 2} f(x) = f(2) \)
26. What are the points of discontinuity?

   a) \( f(x) = \frac{3}{x+2} \),

   b) \( g(x) = \frac{x}{x^2+4} \)

27. Find the derivative of each of the following functions.

   a) \( f(x) = 3 \rightarrow f'(x) = \) ______

   b) \( f(x) = x^5 \rightarrow \)

   c) \( g(x) = 4x^4 \rightarrow \)

   d) \( g(x) = 1-2x \rightarrow \)

28. Use the following curve to find

   ![Curve Image]

   a) \( f(0) = \) ______

   b) \( f(2) = \) ______

   c) \( f(6) = \) ______

   d) \( \lim_{x \to 0} f(x) = \) ______

   e) \( \lim_{x \to 6} f(x) = \) ______

   f) \( \lim_{x \to \infty} f(x) = \) ______

   g) \( \lim_{x \to 6^-} f(x) = \) ______

   h) Find one point (value of x) at which \( f'(x) = 0 \). @ x = ______