

### Answer on Question #53370 – Math – Statistics and Probability

Given  $z$  is a standard normal random variable, answer questions 1 through 4.

1.  $p(z = 2.3)$  is

a. .1056.

b. 0.

c. .8944.

d. .3944.

#### Solution:

$p(z = 2.3) = 0$ , because  $z$  is a standard normal random variable.

Thus, the answer is b. 0.

2.  $p(z \geq -1.84)$  is

a. .5474.

b. 0.

c. .0329.

d. .9671.

#### Solution:

The normal random variable of a standard normal distribution is called a standard score or a z-score. Every normal random variable  $X$  can be transformed into a z score via the following equation:

$$z = \frac{(X - \mu)}{\sigma}$$

where  $X$  is a normal random variable,  $\mu$  is the mean of  $X$ , and  $\sigma$  is the standard deviation of  $X$ .

In the given problem we require

$$1 - P(Z < -1.84) = 1 - \Phi(-1.84) = 1 - 0.0329 = 0.9671,$$

where  $\Phi$  is the cumulative distribution function of a standard normal variable

Thus, the answer is d. .9671.

3.  $p(z \leq 1.4)$  is

- a. .0808.
- b. .9192.
- c. .9927.
- d. 0.

**Solution:**

In given case if  $p(z \leq 1.4)$  is 0.9192 from the normal table.

Thus, the answer is b. .9192.

4.  $p(0.5 \leq z \leq 2.9)$  is

- a. 0.
- b. .6915.
- c. .3066.
- d. 9981.

**Solution:**

We have to apply the following method:

$$P(0.5 \leq z \leq 2.9) = P(Z \leq 2.9) - P(Z \leq 0.5) = \Phi(2.9) - \Phi(0.5) = 0.9981 - 0.6915 \\ \approx 0.3066$$

Thus, the answer is c. .3066.