11th Grade
Worksheet Bundle

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Study Island 11th Grade Reading - Literal and Intended Meaning

Question 1 .

Old-fashioned values are making a comeback today. It is the most evident on little girls who dress up like "ladies." You just need to take a quick stroll in the mall to see little girls, who are three to four feet tall, wearing make-up and diva outfits. Do not mistake their cherry red lips for melted ice-cream. In fact, these are glistened with lip gloss. It is true-the corsets are replaced by tights and low-rise jeans and mini-skirts. You might see different variations of dyes on these little ladies' hair. The creativity of these young ones is reflected in the way they master copying each other or the rock stars they admire. In order to appear ladylike, these young children imitate the act, gait, and talk of teenagers or young adults. They think they successfully skip their childhood and go forward in time to become ladies.

Why does the author use satire in this piece?

- **A.** to inspire girls to eat ice cream to create various color-stains on their young lips
- **B.** to acknowledge the need of children successfully skipping their younger years
- **C.** to encourage fashion industry to create more old-fashioned clothes like corsets
- **D.** to ridicule the absurdity of children trying to look like fully-grown women

Question 2 .

Directions: Select the correct text in the passage.

Which sentence from the excerpt contains sarcasm?

The Forest

In the shadows of the forest, all of the shapes were unclear. Trees did not appear to be trees, and animals seemed larger than normal. Stacey and Jillian cut through the forest because it was a shortcut to their houses on the other side. Jillian walked calmly and coolly through the trees while Stacey huddled close to Jillian. Every once in a while, Stacey would look into the dark surroundings and shiver even though it was not cold.

Jillian looked over at Stacey and said, "Are you scared or something?"

"No, I just like to shake for no reason in the dark," Stacey answered.

Jillian sighed and said, "Fine, just stick by me if you want to."

Stacey and Jillian both continued on their way through the forest in total silence. Finally, they saw the edge of the forest. Stacey felt as if she could breathe easy until she heard someone or something scream from behind them.

Question 3 .

Mimi could not believe how sturdy her car was. When she was rear ended at the stop sign and turned around, she had seen smoke coming out of the other car, a red wagon. Its front looked like a smashed cake. Mimi saw the deflated airbags and the shattered windscreen. The driver, a young girl wearing a band uniform, came out of the red wagon, shaken but uninjured. Mimi gathered courage and walked out of her car to face its rear end. She was shocked to see just a few scratches and a dent. Finally, Mimi realized that nobody was hurt in the accident either. Mimi then remembered that she needed to exchange information with the young girl and asked her how she was feeling.

"Alright," the young girl replied with a nervous laugh. "_____"

Which of these would demonstrate understatement if added to the young girl's dialogue?

- **A.** Although my car is scratched up!
- **B.** What an obvious question to ask!
- **C.** Can't you see I almost died today?
- **D.** I think I will be fine in a couple of weeks.

Question 4 .

Free Will

"You want to try the burger here," Roxy told Pete excitedly, as she parked her car. "It is the best!"
Wait a minute—do I really want it? Pete asked himself. "Is it, Roxy?"
"That's why I brought you here. You have been talking about burgers all morning, don't you remember?" Roxy expressed her intent.
"But, I do think I need to eat healthier," Pete responded. *I am a man of my own will. I will eat what I want and not what others think I want.* "Maybe I will get a salad. Yeah, I will get a salad."
"Don't you want a burger?" Roxy asked, voicing her confusion.
"No, a salad," Pete declared with firmness.

Pete tries so hard to follow his will that he does not want to eat what he originally craved. This is an example of

- **A.** irony.
- **B.** understatement.
- **C.** sarcasm.
- **D.** satire.

Question 5 .

Old-fashioned values are making a comeback today. It is the most evident on little girls who dress up like "ladies." You just need to take a quick stroll in the mall to see little girls, who are three to four feet tall, wearing make-up and diva outfits. Do not mistake their cherry red lips for melted ice-cream. In fact, these are glistened with lip gloss. It is true-the corsets are replaced by tights and low-rise jeans and mini-skirts. You might see different variations of dyes on these little ladies' hair. The creativity of these young ones is reflected in the way they master copying each other or the rock stars they admire. In order to appear ladylike, these young children imitate the act, gait, and talk of teenagers or young adults. They think they successfully skip their childhood and go forward in time to become ladies.

Which of these is an example of irony this passage?

- **A.** Do not mistake their cherry red lips for melted ice-cream.
- **B.** You just need to take a quick stroll in the mall to see little girls, who are three to four feet tall. . . .
- **C.** You might see different variations of dyes on these little ladies' hair.
- **D.** The creativity of these young ones is reflected in the way they master copying each other. . . .

Question 6 .

The Price of Popularity

Jenny was a smart girl who had good grades and good friends. However, she wanted to be like her sister Alex who was very popular in school. The girls followed Alex's attire as the last word in fashion. The boys in school starved and struggled for Alex's attention. As if that was not enough, even the teachers adored Alex who had won many debate championships for the high school. Thus, Jenny became consumed with the idea that high school was all about popularity.

Jenny started to try on her sister's outfits and shoes. Although she was much taller than Alex, and had never walked around wearing heels, Jenny decided to wear her sister's clothes and cling to her sense of style. One morning, Jenny left for school on the bus, as she didn't want her parents dropping her off at school. She donned Alex's red skirt dress and wore pencil heels to match.

As soon as Jenny got off the bus in front of the library, her feet landed on a pothole, and the heel of her right shoe broke into three different miserable pieces. To add to Jenny's predicament, a big patch of muddy stain attacked the red dress. A big crowd had gathered out of nowhere, and Jenny lay fallen on the floor. She had heard the laughter and the hushed voices. One of the onlookers said, "Doesn't she look fantastic?"

Which of these **best** describes the irony in the story?

- **A.** Jenny tries to become popular but ends up embarrassing herself.
- **B.** Even the teachers adore Alex who is popular with many kids in school.
- **C.** Alex does not have to try to become popular like her sister Jenny.
- **D.** Jenny tries on her sister's outfits, but she doesn't like wearing them.

Question 7 .

I remember that afternoon when our town was flooded. Events could not have happened any faster. I saw the canopy of trees about to kiss the overflowing lake. The water started swallowing roofs, and cars were floating like paper boats. Thankfully, our capitol building was built on an elevated level, and the cops managed to direct the entire population of our town to the building within the first two hours of the flood. The building was quickly crowded, and I could feel everyone breathing on me. I wiggled my way out to get to the window next to which our mayor was standing still as a statue.

“I see we have a problem here,” the mayor said as he pointed outside.

All we could see was a massive lake where our town used to be. Our town had indeed looked better.

Which of these is an example of understatement in this story?

- **A.** The building was quickly crowded, and I could feel everyone breathing on me.
- **B.** I saw the canopy of trees about to kiss the overflowing lake.
- **C.** "I see we have a problem here,” the mayor said as he pointed outside.
- **D.** The water started swallowing roofs, and cars were floating like paper boats.

Question 8 .

Today was the big day. Pedro was interviewing for the job of his dreams. Nobody, not even Pedro himself could believe that there was a job that paid for blogging about and taking pictures of rare trees around the world. When Pedro had majored in photography, journalism, and biology in college, his parents had thought that he was losing his mind. They were worried that their brilliant son was wasting his genius. So, today was the day Pedro had to prove that it was all worth it.

Pedro ironed his dry-cleaned suit again, flossed his teeth, fixed every strand of his unruly hair, and got dressed for the interview. He drove to the café where he was meeting George Beforeman, the potential boss, and ordered a cold coffee to kill time. Pedro was calm until he saw someone fitting the description of George enter the front door. It was at the precise moment that George smiled at Pedro that Pedro spilled his cold coffee on his crisp suit.

How is Pedro's situation ironic?

- **A.** Pedro ends up ruining the suit while trying hard to make a good impression.
- **B.** Pedro is smart, but he wants to waste his time researching rare trees.
- **C.** Pedro orders cold coffee while he is trying to kill time before the interview.
- **D.** Pedro tries too hard to appear crisp in front of the potential employer.

Question 9 .

The Templetons' Nightmare

The Templetons had decided to pack their bags and leave for their villa in Vermont. They needed to get away from the hustle and bustle of the city. Besides, their teenage kids had agreed to keep them company. The Templetons left at once, before their children could change their minds. They drove with great hopes for a quiet weekend as Mrs. Templeton announced, "Kids, prepare to sit back and do absolutely nothing. We are going to have a blast!"

The drive was not without incident. The family had survived a deer attack on their SUV. Following the deer fiasco, the back tires were flat. Tyler had misplaced the toolbox when he was helping his father change tires. After that, Jen decided to scream every time her mother hit the brakes. After much fuss and screaming, the Templetons finally arrived at their villa.

They had not been to the villa in a few years. The caretaker had abandoned the villa in a state of pity. There was mold in the bathroom and curtains of spider web in every single room of the building. Jen and Tyler whined as they were asked to help their parents clean the villa. By the time the Templetons were done turning their vacation home into a livable condition, it was time to head back to their busy city lives.

"I am as refreshed as a factory worker after a long day," Tyler remarked as the Templetons left the villa.

What is ironic about the Templetons' situation in the story?

- **A.** They try to have a relaxing weekend and spend their vacation in chaos.
- **B.** They do not come prepared with things they need in a Vermont villa.
- **C.** Their kids are lazy and whiny throughout the whole trip to Vermont.
- **D.** The kids agree to come with their parents for a weekend getaway.

Question 10 .

Robin had done it. After four years of toiling day and night, he was finally going to walk down the stage, shake hands with the president, and get his Engineering diploma. As he sat among the crowd, his heart beamed with joy. Robin was already dreaming of the perfect job he had to find and the adventurous life he was to live. *It will be like a dream*. Robin knew he still had the student loan to pay off and many mundane details to take care of, but he just wanted to dream about his bright future for now. He even daydreamed as he actually walked down the stage. Reality only slapped him on the face when the office of alumni relations, standing on the other end of the stage, gave him an alumni pin and asked for a donation to support his alma mater.

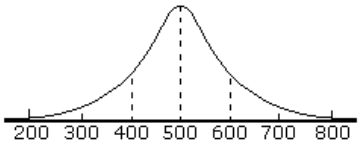
Which of these reveals the irony in Robin's situation?

- **A.** He dreams of the perfect job and adventures before they happen.
- **B.** He is asked for a donation while he has to pay the student loan.
- **C.** He keeps on dreaming during an important occasion of his life.
- **D.** He is thinking about mundane details while he is graduating.

Study Island 11th Grade Algebra - Normal Distribution

Question 1 .

SAT scores are designed so that they are normally distributed as shown below.



Out of 1,000 students who take the SAT, how many score between 400 and 600?

- **A.** 500
- **B.** 340
- **C.** 750
- **D.** 680

Question 2 .

Matthew plays basketball for his high school. On average, he scores 32 points per game, with a standard deviation of 4 points. What percentage of basketball games will result in Matthew scoring less than 20 points?

Note: Assume that a Normal model is appropriate for the distribution of points.

- **A.** Matthew will score less than 20 points in about 0.15% of his basketball games.
- **B.** Matthew will score less than 20 points in about 49.85% of his basketball games.
- **C.** Matthew will score less than 20 points in about 99.7% of his basketball games.
- **D.** Matthew will score less than 20 points in about 0.3% of his basketball games.

Question 3 .

Directions: Select the correct answer from each drop-down menu.

Sandra is comparing her midterm and final grades for her statistics class.

The midterm had an overall mean score of 70 with a standard deviation of 6 for all test takers. Sandra scored a 73.

The final had an overall mean score of 73 with a standard deviation of 8 for all test takers. Sandra scored an 81.

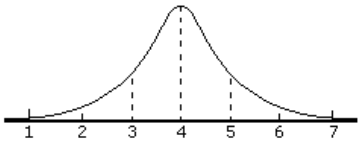
Given that the data for both tests was approximately normal, standardize the test scores and find the area under the normal curve to the left of the standardized test scores.

The greater area results from the area under the curve from the [ ] with an area of [ ] .

The difference in the two areas is [ ] .

Question 4 .

The amount 6th grade students grow during the school year is normally distributed with a mean of 4 inches and a standard deviation of 1 inch as shown below.



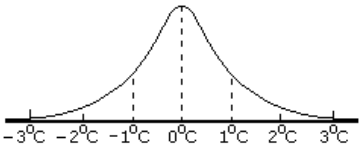
Growth of 6th Graders (in.)

How many inches do 97.5% of 6th graders grow?

- **A.** more than 3 in.
- **B.** more than 5 in.
- **C.** less than 6 in.
- **D.** There is not enough information.

Question 5 .

A thermometer company makes a group of thermometers. At 0°C, some thermometers give readings of less than or more than 0°C. Assume the readings are normally distributed with a mean reading of 0°C and a standard deviation of 1°C as shown in the graph below.



About 99.8% of the data lies within which range?

- **A.** [-3°C,3°C]
- **B.** [-1°C,1°C]
- **C.** [0°C,6°C]
- **D.** [-2°C,1°C]

Question 6 .

A child psychologist conducted a study and determined that, on average, children, who live in Hillsdale, watch 36 minutes of television per day, with a standard deviation of 3 minutes. What percentage of children, who live in Hillsdale, watch more than 39 minutes of television per day?

Note: Assume that a Normal model is appropriate for the distribution of viewing times.

- **A.** About 32% of children, who live in Hillsdale, watch more than 39 minutes of television per day.
- **B.** About 68% of children, who live in Hillsdale, watch more than 39 minutes of television per day.
- **C.** About 34% of children, who live in Hillsdale, watch more than 39 minutes of television per day.
- **D.** About 16% of children, who live in Hillsdale, watch more than 39 minutes of television per day.

Question 7 .

Matt and Taylor are taking a test. The test is designed to produce an overall mean score of 80, with a standard deviation of 6 for all test takers. Suppose Matt scored a 85 on the test and Taylor scored a 78 on the test. Given that the data is approximately normal, standardize each test score and find the area under the normal curve between the standardized test scores.

- **A.** The area between the standardized test scores is 0.7967.
- **B.** The area between the standardized test scores is 0.3707.
- **C.** The area between the standardized test scores is 1.1674.
- **D.** The area between the standardized test scores is 0.426.

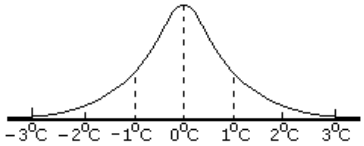
Question 8 .

Cedar Hills Farm claims that the average weight of one of its watermelons is 18 pounds, with a standard deviation of three pounds. A grocery supplier of Cedar Hills Farm's watermelons says that the average weight is 15 pounds. Given that the data is approximately normal, standardize the weight of a Cedar Hills Farm watermelon and find the area under the normal curve below the standardized weight.

- **A.** The area below the standardized weight is 0.7486.
- **B.** The area below the standardized weight is 0.8413.
- **C.** The area below the standardized weight is 0.1587.
- **D.** The area below the standardized weight is 0.2514.

Question 9 .

A thermometer company makes a group of thermometers. At 0°C, some thermometers give readings of less than or more than 0°C. Assume the readings are normally distributed with a mean of 0°C and a standard deviation of 1°C as shown in the graph below.



Which percent of readings lie between 0°C and 2°C?

- **A.** 50.5%
- **B.** 47.5%
- **C.** 42.5%
- **D.** 33.4%

Question 10 .

In a statistics course, the average midterm test score was 77, with a standard deviation of 1. What percentage of the midterm test scores are above 79?

Note: Assume that a Normal model is appropriate for the distribution of test scores.

- **A.** About 5% of the midterm test scores lie above 79.
- **B.** About 2.5% of the midterm test scores lie above 79.
- **C.** About 47.5% of the midterm test scores lie above 79.
- **D.** About 95% of the midterm test scores lie above 79.

Answers: Reading - Literal and Intended Meaning

1. D
2. --
3. A
4. A
5. D
6. A
7. C
8. A
9. A
10. B

Explanations: Reading - Literal and Intended Meaning

1. Satire is irony, sarcasm, or caustic wit used to attack or expose folly, vice, or stupidity. This piece uses wit and irony to show that little girls who try to dress up like grown-ups look absurd. The author does not approve of these behaviors in a roundabout language.

2. In literature, sarcasm is a form of verbal irony in which a speaker or character strongly states the opposite of the truth.
The sentence "'No, I just like to shake for no reason in the dark,' Stacey answered" contains sarcasm. Readers can tell that Stacey's response is sarcastic because Stacey has been shivering and walking close to Jillian. Both actions indicate that Stacey is indeed afraid of walking in the dark forest.

3. Understatement is a figure of speech that says less than is intended. It is the opposite of hyperbole (overstatement) and may be used for ironic effect or comic relief. If the young girl described the smashed up car as just being scratched, she would be using understatement. Understatement is intended to provide a comic relief in this passage. The young girl is trying to lighten up the situation.

4. In this story, there is a discrepancy between what Pete thinks and says. He thinks he will eat what he wants and not what others think he wants. However, Roxy reveals that Pete originally talks about wanting a burger and not a salad. The title of the story also reveals the irony—Pete is not acting according to his will.

5. Irony is used to express the exact opposite of its literal meaning. It is the difference between what appears to be and what actually is. Irony is also applied to situations when the opposite of what is expected happens. The author means to say that "copying" each other or the rock stars is not creativity. By saying the opposite of what he or she means, the author creates irony in this passage.

6. The irony in the story is the unexpected that happens despite Jenny's efforts. When Jenny tries really hard to become popular, she ends up being embarrassed in front of a big crowd. Although the incident of Jenny's falling on the floor might make her popular, it is not the kind of fame she is looking for.

7. In this passage, the author uses understatement for comic relief. Understatement is a figure of speech that says less than is intended. It is the opposite of hyperbole (overstatement) and may be used for ironic effect or comic relief. The town is facing a disaster. The mayor's description of the disaster as a "problem" is intended to lighten up the mood.

8. Irony is used to express the exact opposite of its literal meaning. It is the difference between what appears to be and what actually is. Irony is also applied to situations when the opposite of what is expected happens. It is ironic that Pedro ends up acting clumsy while trying hard to make a great impression on his potential employer.

9. The story exemplifies a situational irony. In a situational irony, the outcome of events is contrary to what is expected at the beginning. Irony can be in the words a person says, his or her attitude, or in the unexpected outcomes of events. The Templetons travel to their villa in Vermont for a vacation, and their trip ends up being anything but relaxing.

10. Irony is used to express the exact opposite of its literal meaning. It is the difference between what appears to be and what actually is. Irony is also applied to situations when the opposite of what is expected happens. It is ironic that before Robin is free of student loan, he is asked for a donation as he gets his diploma from his college.

Answers: Algebra - Normal Distribution

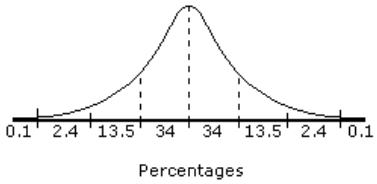
1. D
2. A
3. --
4. C
5. A
6. D
7. D
8. C
9. B
10. B

Explanations: Algebra - Normal Distribution

1. When given a normal distribution graph, the peak represents the mean of the data and the following properties apply.

- About 68% of the data lies within 1 standard deviation of the mean.
- About 95% of the data lies within 2 standard deviations of the mean.
- About 99.8% of the data lies within 3 standard deviations of the mean.

The following graph illustrates these properties.



Comparing the two graphs, the percentage of students that score between 400 and 600 can be calculated.

$$34\% + 34\% = 68\%$$

Then, calculate 68% of the 1,000 students.

$$1{,}000 \times 0.68 = 680$$

Therefore, **680** students scored between 400 and 600.

2. Given that the distribution of points can be modeled by a Normal model, it is known that the number of points that Matthew scores in about 68% of his basketball games will fall within 1 standard deviation of the mean, the number of points that Matthew scores in about 95% of his basketball games will fall within 2 standard deviations of the mean, and the number of points that Matthew scores in about 99.7% of his basketball games will fall within 3 standard deviations of the mean.

The question asks for the percentage of basketball games that will result in Matthew scoring less than 20 points. It is known that 20 points is located 3 standard deviations from the mean (32 points ± 3(4 points)); therefore, about 99.7% of basketball games will result in Matthew scoring between 20 points and 44 points. This means that 0.3% of basketball games will result in Matthew scoring less than 20 points or greater than 44 points. Since the question is only interested in the percentage of basketball games that will result in Matthew scoring less than 20 points, divide by 2 to obtain the final answer.

$$0.3\% \div 2 = 0.15\%$$

Matthew will score less than 20 points in about 0.15% of his basketball games.

3. When a distribution is modeled by a normal model, the sample data ($\bar{x}$) needs to be standardized. The sample data ($\bar{x}$) is standardized using the population mean (μ) and the population standard deviation (σ). The standardized value is often called the *z*-score and can be found by using the formula below.

$$z = \frac{\bar{x} - \mu}{\sigma}$$

First, identify the sample mean, the population mean, and the population standard deviation from the midterm.

$$\bar{x} = 73$$

$$\mu = 70$$

$$\sigma = 6$$

Calculate the standardized test score for the midterm using the formula above.

$$z = \frac{\bar{x} - \mu}{\sigma}$$

$$= \frac{73 - 70}{6}$$

$$= 0.5$$

Given that the data is approximately normal, the associated standardized value can be used to find the area under the normal curve. The area below the standardized value is found using the standard normal table.
Find the area below using the standardized test score.

$$P(z < 0.5) = 0.6915$$

The area below the standardized midterm score is 0.6915.
Next, identify the sample mean, the population mean, and the population standard deviation from the final.

$$\bar{x} = 81$$

$$\mu = 73$$

$$\sigma = 8$$

Calculate the standardized test score for the midterm using the formula above.

$$z = \frac{\bar{x} - \mu}{\sigma}$$

$$= \frac{81 - 73}{8}$$

$$= 1$$

Given that the data is approximately normal, the associated standardized value can be used to find the area under the normal curve. The area below the standardized value is found using the standard normal table.
Find the area below using the standardized test score.

$$P(z < 1) = 0.8413$$

The area below the standardized final score is 0.8413.
Since 0.8413 is greater than 0.6915, the greater area results from the area under the curve from the **final** with an area of **0.8413**.
Find the difference in the two areas.

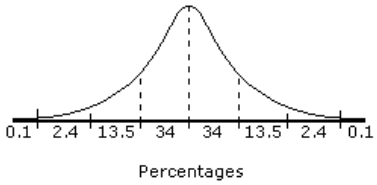
$$0.8413 - 0.6915 = 0.1498$$

Therefore, the difference in the two areas is **0.1498**.

4. When given a normal distribution graph, the peak represents the mean of the data and the following properties apply.

- About 68% of the data lies within 1 standard deviation of the mean.
- About 95% of the data lies within 2 standard deviations of the mean.
- About 99.8% of the data lies within 3 standard deviations of the mean.

The following graph illustrates these properties.



Comparing the two graphs, first find the percentage of 6th graders who grow more than 3 in.

$$34\% + 34\% + 13.5\% + 2.4\% + 0.1\% = 84\%$$

Then, find the percentage of 6th graders who grow more than 5 in.

$$13.5\% + 2.4\% + 0.1\% = 16\%$$

Next, find the percentage of 6th graders who grow less than 2 in.

$$2.4\% + 0.1\% = 2.5\%$$

Last, find the percentage of 6th graders who grow less than 6 in.

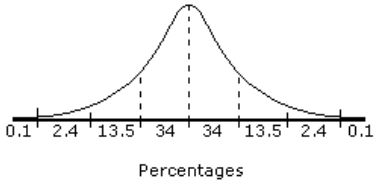
$$13.5\% + 34\% + 34\% + 13.5\% + 2.4\% + 0.1\% = 97.5\%$$

Therefore, 97.5% of 6th graders grow **less than 6 in.**

5. When given a normal distribution graph, the peak represents the mean of the data and the following properties apply.

- About 68% of the data lies within 1 standard deviation of the mean.
- About 95% of the data lies within 2 standard deviations of the mean.
- About 99.8% of the data lies within 3 standard deviations of the mean.

The following graph illustrates these properties.



Since 99.8% of the data lies within 3 standard deviations of the mean, the range is **[-3°C,3°C]**.

6. Given that the distribution of viewing times can be modeled by a Normal model, it is known that the time spent watching television per day by about 68% of children will fall within 1 standard deviation of the mean, the time spent watching television per day by about 95% of children will fall within 2 standard deviations of the mean, and the time spent watching television by about 99.7% of children will fall within 3 standard deviations of the mean.

The question asks for the percentage of children that watch more than 39 minutes per day. The viewing time of 39 minutes is located 1 standard deviation away from the mean (36 minutes ± 3 minutes); therefore, about 68% of children will watch between 33 minutes and 39 minutes of television per day. This means that 32% of children will watch less than 33 minutes or more than 39 minutes of television. Since the question is only interested in the percentage of children who watch more than 39 minutes of television per day, divide by 2 to obtain the final answer.

$$32\% \div 2 = 16\%$$

About 16% of children, who live in Hillsdale, watch more than 39 minutes of television per day.

7. When a distribution is modeled by a Normal model, the sample data ($\bar{x}$) needs to be standardized. The sample data ($\bar{x}$) is standardized using the population mean (μ) and the population standard deviation (σ). The standardized value is often called the z-score and can be found using the formula below.

$$z = \frac{\bar{x} - \mu}{\sigma}$$

Identify the sample means, the population mean, and the population standard deviation.

$$\bar{x}_{\mathrm{M}} = 85$$

$$\bar{x}_{\mathrm{T}} = 78$$

$$\mu = 80$$

$$\sigma = 6$$

Calculate the standardized test score for Matt using the formula above.

$$z_{\mathrm{M}} = \frac{\bar{x}_{\mathrm{M}} - \mu}{\sigma}$$

$$= \frac{85 - 80}{6}$$

$$\approx 0.83$$

Given that data is approximately normal, the associated standardized value can be used to find the area under the normal curve. The area below the standardized value is found using the standard normal table.

Find the area below Matt's standardized test score.

$$\mathrm{P}\left(z_{\mathrm{M}} < 0.83\right) = 0.7967$$

The area below Matt's standardized test score is 0.7967.

Calculate Taylor's standardized test score using the formula above.

$$z_{\mathrm{T}} = \frac{\bar{x}_{\mathrm{T}} - \mu}{\sigma}$$

$$= \frac{78 - 80}{6}$$

$$\approx -0.33$$

Given that data is approximately normal, the associated standardized value can be used to find the area under the normal curve. The area below the standardized value is found using the standard normal table.

Find the area below Taylor's standardized test score.

$$\mathrm{P}\left(z_{\mathrm{T}} < -0.33\right) = 0.3707$$

The area below Taylor's standardized test score is 0.3707.

To calculate the between the standardized test scores, subtract.

$$0.7967 - 0.3707 = 0.426$$

The area between the standardized test scores is 0.426.

8. When a distribution is modeled by a Normal model, the sample data ($\bar{x}$) needs to be standardized. The sample data ($\bar{x}$) is standardized using the population mean (μ) and the population standard deviation (σ). The standardized value is often called the z-score and can be found using the formula below.

$$z = \frac{\bar{x} - \mu}{\sigma}$$

Identify the sample mean, the population mean, and the population standard deviation.

$$\bar{x} = 15 \text{ pounds}$$

$$\mu = 18 \text{ pounds}$$

$$\sigma = 3 \text{ pounds}$$

Calculate the standardized weight using the formula above.

$$\begin{aligned} z &= \frac{\bar{x} - \mu}{\sigma} \\ &= \frac{15 \text{ pounds} - 18 \text{ pounds}}{3 \text{ pounds}} \\ &= -1 \end{aligned}$$

Given that data is approximately normal, the associated standardized value can be used to find the area under the normal curve. The area below the standardized value is found using the standard normal table.

Find the area below the standardized weight.

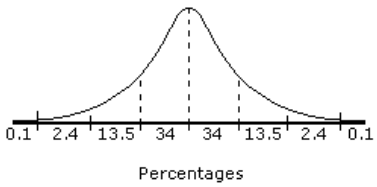
$$P(z < -1) = 0.1587$$

The area below the standardized weight is 0.1587.

9. When given a normal distribution graph, the peak represents the mean of the data and the following properties apply.

- About 68% of the data lies within 1 standard deviation of the mean.
- About 95% of the data lies within 2 standard deviations of the mean.
- About 99.8% of the data lies within 3 standard deviations of the mean.

The following graph illustrates these properties.



Comparing the two graphs, between 0°C and 2°C, there is the following percentage of readings.

34% + 13.5% = 47.5%

Thus, **47.5%** of the readings lie within the given range.

10. Given that the distribution of test scores can be modeled by a Normal model, it is known that about 68% of the midterm test scores fall within 1 standard deviation of the mean, about 95% of the midterm test scores fall within 2 standard deviations of the mean, and about 99.7% of the midterm test scores fall within 3 standard deviations of the mean.

The question asks for the percentage of the midterm test scores that are above 79. The test score of 79 is located 2 standard deviations from the mean (77 ± 2(1)); therefore, about 95% of the midterm test scores fall within 75 and 79. This means that 5% of the midterm test scores are below 75 or above 79. Since the question is only interested in the percentage of midterm test scores that are above 79, divide by 2 to obtain the final answer.

5% ÷ 2 = 2.5%

About 2.5% of the midterm test scores lie above 79.