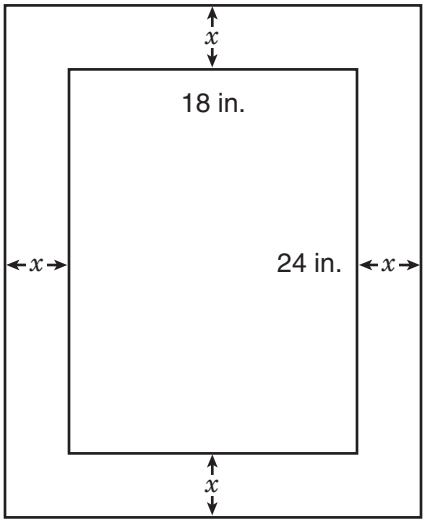
Grade 8 Grid-In Sample Problems

DIRECTIONS: Solve each question. You can use the extra grid-in answer sheet on page 288 to record your answers. Print only one number or symbol in each box. Under each box, fill in the circle that matches the number or symbol you wrote above. **DO NOT FILL IN A CIRCLE UNDER AN UNUSED BOX. DO NOT LEAVE A BOX BLANK IN THE MIDDLE OF AN ANSWER.**

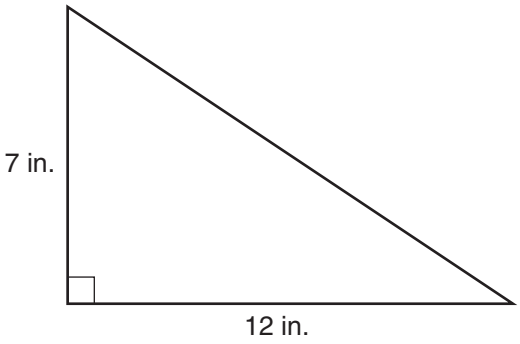
1. Olivia is building a frame for a painting. The painting is 24 inches high and 18 inches wide. She wants the height of the framed painting to be 125% of the height of the painting. The width of the frame around the painting will be the same on all sides, as shown in the diagram. What is x, the width of the frame, in inches?



2. $-6.7,\ 5\frac{1}{2},\ 3.4,\ -2\frac{3}{4}$

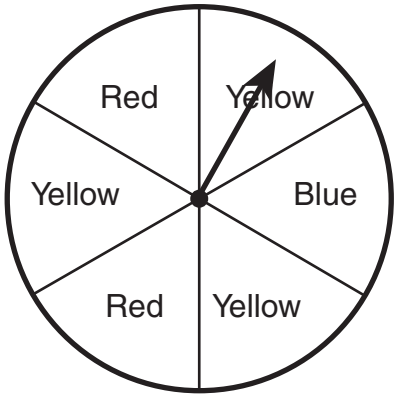
What is the sum of the numbers shown above, expressed as a decimal?

3. A landscape architect drew a plan for a flower bed in a park. The plan is shown.



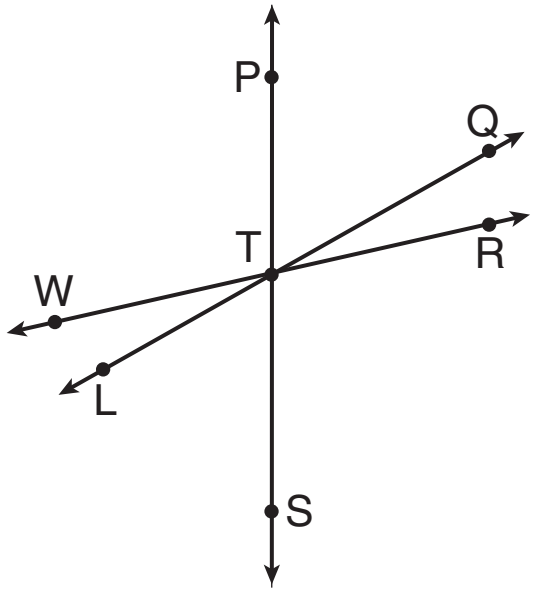
The plan has a scale of $\frac{1}{2}$ inch = 3 feet. What is the area of the actual flower bed, in square feet?

4. Sebastian is tossing a coin and spinning a spinner that has 2 red sections, 3 yellow sections, and 1 blue section, all the same size. What is the probability, expressed as a decimal, that Sebastian randomly tosses heads on the coin and spins yellow on the spinner?



5. Ivan paid $2.31 in sales tax on an item with an original price of $42.00. Given the same sales tax rate, an item with an original price of $64.00 has a sales tax of $$x$. What is the value of x? (Express your answer as a decimal.)

6. In the figure shown, $m\angle WTL = 2(2x - 1)$, $m\angle LTS = 5x + 6$, $m\angle STR = 11x - 4$, and $m\angle QTR = 3x + 7$.



What is the measure, in degrees, of $\angle PTQ$?

7. What is $\frac{7}{8}$ in decimal form?

8. A bookstore manager will randomly select 2 of 9 different recently arrived books to place in a window display. How many possible pairs of selections are there? (The order of the two books in the window display does not matter.)

9. $pt^3 + p^3t$

What is the value of the expression above when $p = 3$ and $t = -2$?

10. What is the product of $\frac{3}{8}$ and 0.6, expressed as a decimal?

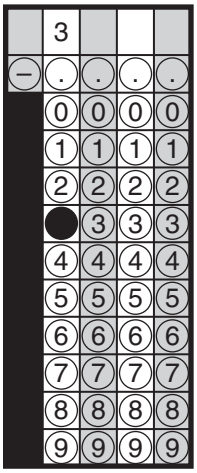
Grade 8
Grid-In Explanations of Correct Answers

1. **(3)** The painting is 24 inches high. Olivia wants the height of the frame to be 125% the height of the painting. The width of the frame will be the same on all sides.

Multiply the height of the painting by 125% to find the height of the frame, in inches.

$24 \times 1.25 = 30$

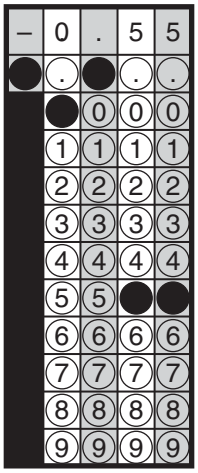
Since the height of the painting is already 24 inches, that leaves 6 inches of frame divided by 2 for the top and bottom. Therefore, *x* is 3 inches.



2. **($^{-}$0.55)** Convert the fractions to decimals:

$-6.7 + 5.5 + 3.4 + (-2.75) =$

$-6.7 + 5.5 + 3.4 - 2.75 = -0.55$



3. **(1512)** The scale is $\frac{1}{2}$ inch = 3 feet. Use that scale to find the base, b, and height, h, of the actual flower bed.

$$\frac{\frac{1}{2}}{3} = \frac{12}{b}$$

$$\frac{1}{2}b = 36$$

$$b = 72$$

$$\frac{\frac{1}{2}}{3} = \frac{7}{h}$$

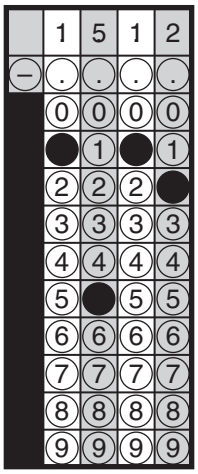
$$\frac{1}{2}h = 21$$

$$h = 42$$

The formula for the area of a triangle is $A = \frac{1}{2}$ base $\times$ height.

$$A = \frac{1}{2}bh = \frac{1}{2}(72)(42)$$

$$A = \frac{1}{2}(3,024) = 1{,}512$$

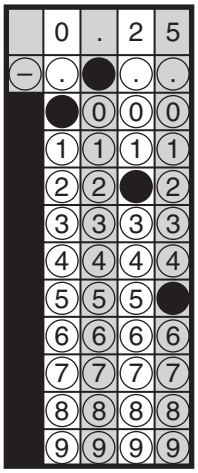


4. **(0.25)** The probability of tossing heads on the coin is 1 out of 2, which is $\frac{1}{2}$.

The probability of spinning yellow on the spinner is 3 out of 6, which is $\frac{3}{6}$ or $\frac{1}{2}$.

The probability of both of these events occurring is the product of the probabilities.

$$\frac{1}{2} \times \frac{1}{2} = 0.25$$

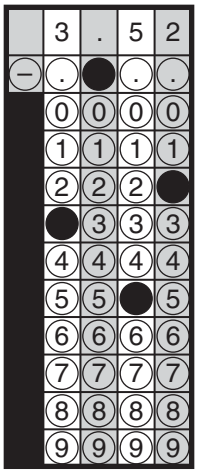


5. **(3.52)** Set up a proportion to solve.

$$\frac{2.31}{42} = \frac{x}{64}$$

$$(64)\left(\frac{2.31}{42}\right) = x$$

$$3.52 = x$$



6. **(51)** Angles $\angle$WTL and $\angle$QTR are congruent because they are vertical angles.

Therefore, $m\angle\text{WTL} = m\angle\text{QTR}$, so $2(2x - 1) = 3x + 7$.

Distributing 2 gives $4x - 2 = 3x + 7$.

Subtracting $3x$ from both sides gives $x - 2 = 7$.

$$x - 2 + 2 = 7 + 2$$

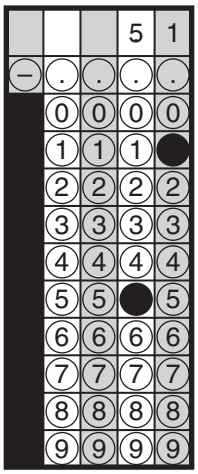
Adding 2 to each side gives $x = 9$.

Angles $\angle$PTQ and $\angle$LTS are congruent because they are vertical angles.

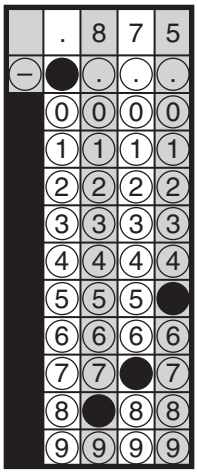
Therefore, $m\angle\text{PTQ} = m\angle\text{LTS} = 5x + 6$.

So

$m\angle\text{PTQ} = 5(9) + 6 = 45 + 6 = 51$.



7. **(.875)** $\frac{7}{8} = 7 \div 8 = .875$



8. **(36)** When selecting a pair of books, the order of the books does not matter.

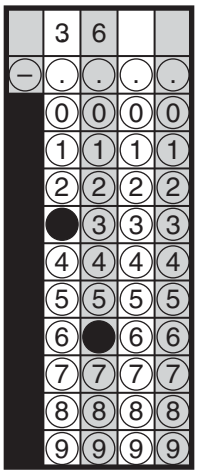
There are 9 books that can be selected for the first book in the pair.

There are 8 books that can be selected for the second book in the pair.

Therefore, there are 72 permutations of books.

However, each pair is repeated twice because the order in which the books were selected does not matter.

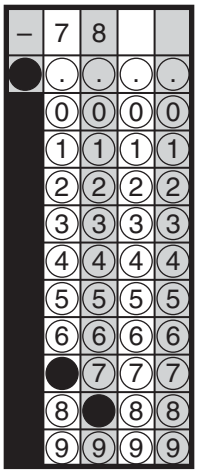
Since each pair is represented twice, divide $\frac{72}{2} = 36$ to show there are 36 pairs of books that can be selected.



9. **(−78)** Substitute the values of p (3) and t (-2) and solve.

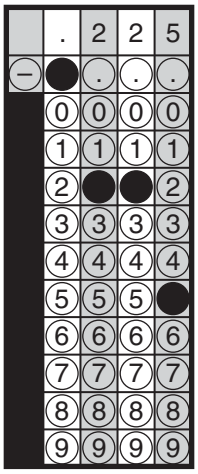
$pt^3 + p^3t = 3(-2)^3 + 3^3(-2) =$

$3(-8) + 27(-2) = -24 - 54 = -78$



10. **(.225)** $\frac{3}{8} = 3 \div 8 = 0.375$

$0.375 \times 0.6 = 0.225$



Answer Key for Grid-In Mathematics

1. 3	6. 51
2. -0.55	7. .875
3. 1512	8. 36
4. 0.25	9. -78
5. 3.52	10. .225

Blank Math Grid-ins to be used with sample items.