Math 9 Written Response

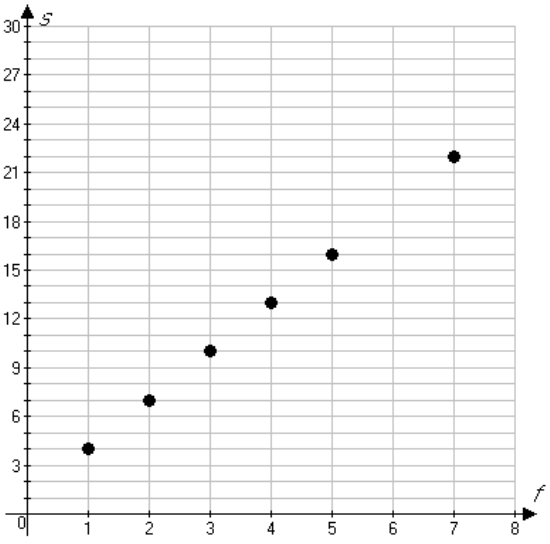
Key and Marking Rubric

Written Response 1

- The number of stars in the three figures shown above follows a pattern. If this pattern continues, then complete the following table of values for the relation between the figure number, *f*, and the number of stars, *s*.

f	1	2	3	4	5	7
s	4	7	10	13	16	22

- Plot these points on the graph paper at right.



- Describe in words the pattern between the number of stars in a figure, *s*, and the figure number, *f*. Write this as a linear relation *s*, in terms of *f*.

Number of stars is always one more than three times the figure number.
$s = 3f + 1$

- Use your equation from the previous bullet to determine which figure will have 283 stars in it.

$$283 = 3f + 1$$
$$-1 \qquad -1$$
$$282 = 3f$$
$$\frac{282}{3} = f$$
$$94 = f$$

Figure 94 will have 283 stars in it.

Mark	Scenarios
1	• partially completing any bullet
2	• correctly completing any one of bullets 2, 3, or 4 or • correctly completing bullet 1 and partially completing any other bullet or • partially completing any 3 bullets
3	• correctly completing any two of bullets 2, 3, and 4 or • correctly completing bullet 1, any other bullet, and partially completing a third bullet
4	• correctly completing any three bullets
5	• correctly completing all four bullets (allow for minor errors such as graph points not in perfect line, graph points connected, or incorrect use of variables)

Notes:

- Partial credit in bullet 1 would be for at most one error in table of values.
- Partial credit in bullet 2 would be at most one graph point significantly out of line, but if incorrect point from bullet 1 is plotted correctly, give full credit in bullet 2.
- Partial credit in bullet 3 would be a word description only or a correct equation only. Student can use other variables such as x and y with no penalty.
- Partial credit in bullet 4 would be for a correct start with equation from previous bullet with an algebraic error in process or a correct answer without supporting

work. If student has incorrect equation in bullet 3 and uses that equation with no errors, give full credit in bullet 4, even though final answer will not be correct.

Written Response 2

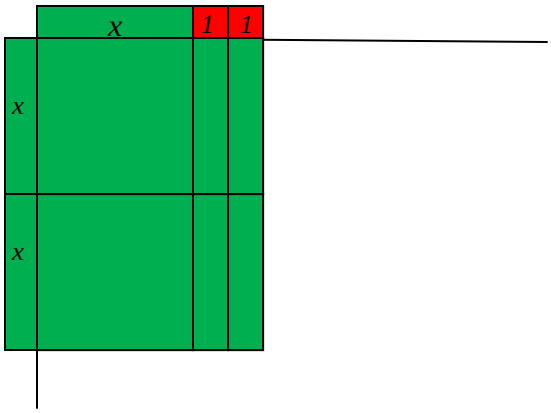
- Write an expression that is a binomial of degree 2

  Answers may vary. Examples: $x^2+3,\ 2y^2+5y$

- Combine the polynomials $(2a-7b+4)-(a+5b-1)+(4a-3b-8)$

  $=5a-15b-3$

- For the polynomial multiplication represented below, sketch the correct shapes of the product inside the frame to create a rectangle, and write the complete multiplication statement in algebraic form in the blank.



Multiplication Statement _____ $2x(x+2)=2x^2+4x$ ___

- Determine the quotient when $(4x^2-6x)$ is divided by $(2x)$

$$\frac{4x^2-6x}{2x}=\frac{4x^2}{2x}-\frac{6x}{2x}=2x-3$$

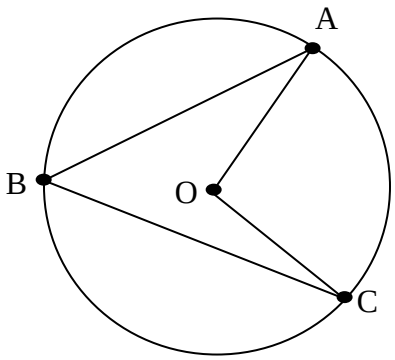
Mark	Scenarios
1	• correctly completing bullet 1 or 2 or 4 or • partially completing bullet 3
2	• correctly completing bullet 3 or • partially completing any three bullets or • correctly completing bullet 1 or 2 or 4 and partially completing bullet 3
3	• correctly completing bullets 1, 2, and 4 or • correctly completing bullet 3 and any other bullet
4	• correctly completing bullet 3 and any two other bullets or • correctly completing bullet 1, any two other bullets, and partially completing the remaining bullet
5	• correctly completing all four bullets (allow for minor errors such as sketches of weaker quality or no shading in shapes in bullet 3, change of variables in bullet 2 or bullet 4)

Notes:

- Partial credit in bullet 1 would be a binomial of incorrect degree or an expression of degree 2 with incorrect number of terms.
- Partial credit in bullet 2 would allow for at most one incorrect coefficient or at most one incorrect sign.
- Partial credit in bullet 3 would allow for correct sketches with no statement or a correct statement with no sketch.
- Partial credit in bullet 4 would allow for one incorrect coefficient, or sign, or exponent.

Written Response 3

- Describe in words the relationship between the measure of $\measuredangle AOC$ and the measure of $\measuredangle ABC$ as shown in the circle with centre O, shown below.



"Angle AOC is twice the measure of angle ABC"

or

"The central angle is double the measure of the inscribed angle"

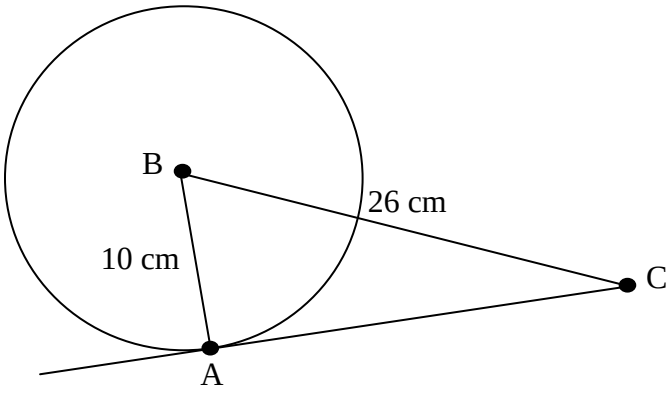
or

"Angle ABC is half the measure of angle ABC"

or

"The inscribed angle is half the measure of the central angle."

- In the diagram below *B* is the centre of the circle, *AB* is a radius of the circle and line *AC* is tangent to the circle at point *A*. Determine the area of ΔABC $\left(A = \frac{h \times b}{2} \right)$.



$x^2 + 10^2 = 26^2$

$x^2 + 100 = 676$

$x^2 = 576$

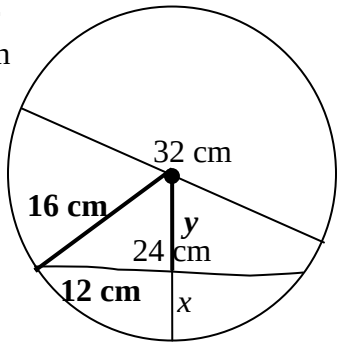
$x = \sqrt{576}$

$x = 24\ cm$

$A = \frac{10 \times 24}{2}$

$A = 120\ cm^2$

- The end of a water pipe is shown at right. There is some water at the bottom of the pipe. Pat says that the depth of water , *x*, in the pipe is 7 cm. Is Pat correct? Justify your answer.



$12^2 + y^2 = 16^2$

$144 + y^2 = 256$

$y^2 = 112$

$y = \sqrt{112}$

$y \approx 10.6\ cm$

$x = 16 - 10.6 = 5.4\ cm$

No, Pat is not correct.

Mark	Scenarios
1	• correctly completing bullet 1 or • partially completing bullet 2 or bullet 3
2	• correctly completing bullet 2 or bullet 3 or • correctly completing bullet 1 and partially completing bullet 2 or bullet 3
3	• correctly completing bullet 1 and one other bullet or • correctly completing bullet 1 and partially completing the other two bullets
4	• correctly completing bullets 2 and 3 or • correctly completing bullet 1 and one other bullet and partially completing the remaining bullet
5	• correctly completing all three bullets (allow minor errors such as missing units in bullets 2 and 3, grammar and spelling errors in bullet 1)

Notes:

- No partial credit for bullet 1. The explanation does not require the words *inscribed angle* and *central angle*, but if not, then angle names as given must be used, and the relationship between must be expressed correctly in either direction.
- Partial credit in bullet 2 would be for correctly determining the length of the third side of the triangle, but not finding the correct area of that right triangle or for correctly stating the triangle's area without supporting work.
- Partial credit in bullet 3 would be earned for saying that No, Pat is not correct without supporting work, or for creating a correctly labeled right triangle in the diagram without the correct answer, or for stopping at 10.6 cm as the distance *x*.