1.

When multiplying polynomials for a math assignment, Pat found the product to be $-4x + 8x^2 - 2x^3 + 5$. He then had to state the leading coefficient of this polynomial. Pat wrote down −4. Do you agree with Pat's answer? Explain your reasoning.

2. The expression mc^2 is used to convert mass into energy (e). Which of the following terms are factors of the expression mc^2? Check all that apply.

- ☐ m
- ☐ c^2
- ☐ c
- ☐ e

3. An expression of the fifth degree is written with a leading coefficient of seven and a constant of six. Which expression is correctly written for these conditions?

1. $6x^5 + x^4 + 7$
2. $7x^6 - 6x^4 + 5$
3. $6x^7 - x^5 + 5$
4. $7x^5 + 2x^2 + 6$

4.

Determine two negative numbers whose sum is -8 and the sum of whose squares is 40.
Put the answers in ascending order:
[ ] and [ ]

5.

The cost of three notebooks and four pencils is $8.50. The cost of five notebooks and eight pencils is $14.50. Determine the cost of one notebook and the cost of one pencil.
[Use an algebraic solution.]

6. The inequality $\frac{1}{2}x + 3 < 2x - 6$ is equivalent to

1. $x < -\frac{5}{6}$
2. $x > -\frac{5}{6}$
3. $x < 6$
4. $x > 6$

7. What is the domain of the function $y = -\log_2(x - 1) + 4$?

1. $x < -1$
2. $x > -1$
3. $x > 4$
4. $x > 1$

8.

In a system of linear inequalities, one inequality is $2x + y > 6$. Write a second inequality for the system of linear inequalities to guarantee that the system does not have a solution. Graph your system of inequalities to show a pictorial representation and support your answer.

9. Which of the following rational expressions would be undefined if $x = -2$?

1. $\frac{x^2 - x - 1}{3x - 8}$
2. $\frac{4x - 8}{x^2 - 2x - 8}$
3. $\frac{x - 2}{x^2 - 2x + 8}$
4. $\frac{x + 2}{(x - 2)(x + 6)}$

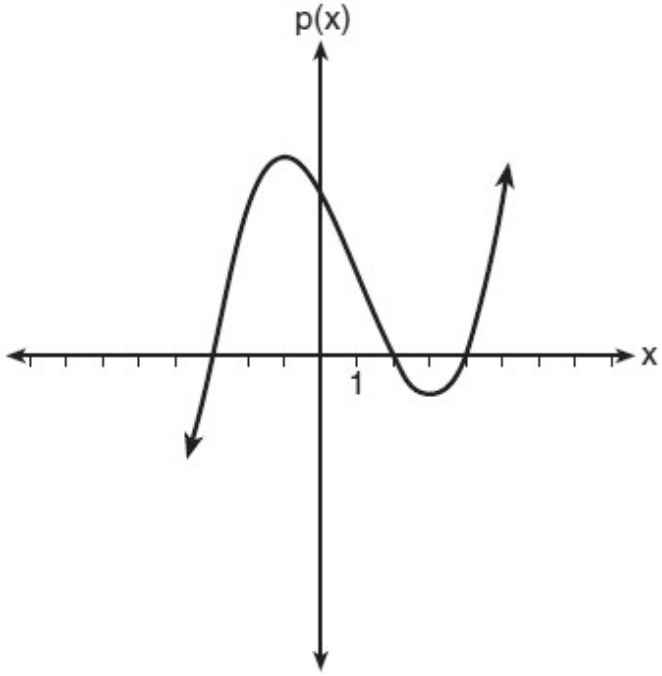
10. Which binomial is a factor of $x^4 - 4x^2 - 4x + 8$?

1. $x - 2$
2. $x + 2$
3. $x - 4$
4. $x + 4$

11. What is the solution set of the equation $(x - 2)(x - a) = 0$?

1. -2 and a
2. -2 and $-a$
3. 2 and a
4. 2 and $-a$

12. Based on the graph below, which expression is a possible factorization of $p(x)$?



1. $(x + 3)(x - 2)(x - 4)$
2. $(x - 3)(x + 2)(x + 4)$
3. $(x + 3)(x - 5)(x - 2)(x - 4)$
4. $(x - 3)(x + 5)(x + 2)(x + 4)$

13. If Angelina's weekly allowance is d dollars, which expression represents her allowance, in dollars, for x weeks?

1. dx
2. $7dx$
3. $x + 7d$
4. $\frac{d}{x}$

14. Marie currently has a collection of 58 stamps. If she buys s stamps each week for w weeks, which expression represents the total number of stamps she will have?

1. $58sw$
2. $58 + sw$
3. $58s + w$
4. $58 + s + w$

15. Gary's pool is in the shape of a rectangle with a length of 16 feet and a width of 9 feet. What is the perimeter of Gary's pool?

1. 20 ft.
2. 30 ft.
3. 40 ft.
4. 50 ft.

16. Which expression represents "5 less than twice x"?

1. $2x - 5$
2. $5 - 2x$
3. $2(5 - x)$
4. $2(x - 5)$

17. The sum of Scott's age and Greg's age is 33 years. If Greg's age is represented by g, Scott's age is represented by

1. $33 - g$
2. $g - 33$
3. $g + 33$
4. $33g$

18. Evaluate the expression $x - y + 6$, when $x = -2$ and $y = 4$.

Answer: _____

19. Which verbal expression is represented by $2(x + 4)$?

1. twice the sum of a number and four
2. the sum of two times a number and four
3. two times the difference of a number and four
4. twice the product of a number and four

20. If speed is equivalent to distance divided by time, what is the speed of an object that travels 200 meters in 25 seconds?

Answer: _____ meters per second

21. What operation would be used to write the following situation as an algebraic expression?

15 classmates had to split p pounds of jelly beans into an equal amount for each person.

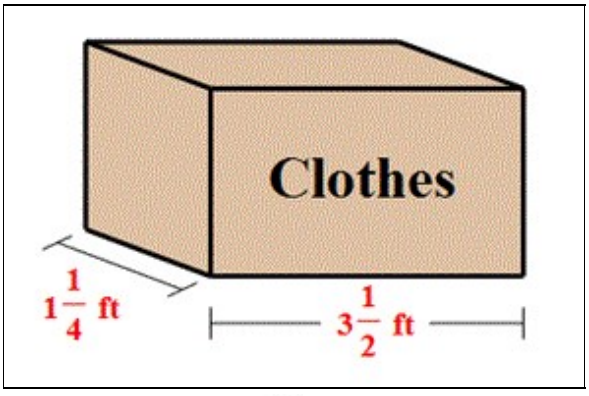
1. addition
2. subtraction
3. multiplication
4. division

22. If $p = 2ak^2$, find p when $a = 1$ and $k = 3$.

1. 9
2. 12
3. 18
4. 30

23.

A thrift store received a donation of pre-worn clothes. The clothes were packaged in five congruent boxes like the one shown below.



The volume of one box is $10\frac{15}{16}$ cubic feet. All of the five donated boxes were stacked on top of each other. What is the height of stacked boxes, in feet? **Show your work!**

24. A correct translation of "six less than twice the value of x" is

1. $2x < 6$ 3. $6 < 2x$
2. $2x - 6$ 4. $6 - 2x$

25. The key words *decreased*, *taken away from*, and *difference* usually mean which operation?

1. addition 3. multiplication
2. subtraction 4. division

26. How can you write the quotient of m and 9 as a mathematical expression?

1. $9m$ 3. $m - 9$
2. $m + 9$ 4. $m \div 9$

27. Look at each expression. Does it represent the variable expression **$2(n + 6)$**?

Select **Yes** or **No** for expressions A – D.

A. Twice a number increased by 6 ○ Yes ○ No

B. Twice the sum of a number and 6 ○ Yes ○ No

C. Two times the quantity of a number plus 6 ○ Yes ○ No

D. The product of two and the quantity of 6 more than a number ○ Yes ○ No

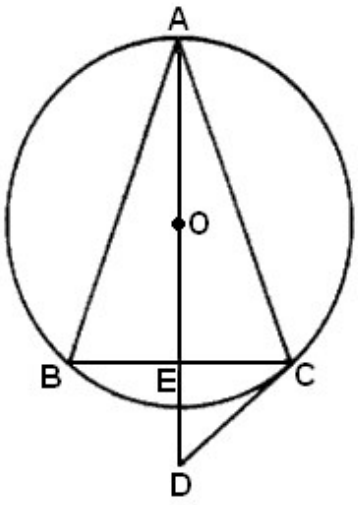
28. Macie just bought a new fish tank. The fish tank is a cube with a side length of 1.75 feet. She is going to fill the fish tank using a small plastic container she found in her kitchen cupboard by filling it at the sink, walking it to the tank, emptying it and repeating the process until the tank is full. If the small plastic container is a cube with the side length of 8 inches, how many trips does she need to make to completely fill the fish tank?

1. 18 trips 3. 95 trips
2. 19 trips 4. 96 trips

29. Fill in the table below with data for the circle. Use the π key on your calculator and round all answers to the *nearest whole number*.

Radius	
Diameter	100
Circumference	
Area	

30. Given: isosceles triangle ABC, with base $\overline{BEC}$, inscribed in circle O. Tangent $\overline{DC}$ is drawn, $\overline{AOED}$ bisects $\angle BAC$, and $m\angle B = 70$.



a) $m\overset{\frown}{BC}$ = [ ]

b) $m\angle BCD$ = [ ]

c) $m\angle BAD$ = [ ]

d) $m\angle BED$ = [ ]

e) $m\angle ADC$ = [ ]

31. Which of the following are examples of Babylonian advancements in math and science? Select all that apply.

- ☐ place value
- ☐ the astrolabe
- ☐ predicting eclipses of the sun and moon
- ☐ the compass
- ☐ an hourly clock