Algebra I – Chapter 8 Test Review

Standards/Goals:

- ✓ **A.APR.1./C.1.d.:**
  - **I can determine the degree of a polynomial**
  - **I can write a polynomial in standard form**
  - **I can combine polynomials using addition and/or subtraction.**
- ✓ **A.APR.1.: I can multiply a monomial and a trinomial together.**
- ✓ **A.SSE.1./C.1.e.: I can factor a monomial from a polynomial.**
- ✓ **A.APR.1./C.1.f.: I can multiply monomials, binomials, trinomials, and polynomials using a variety of methods, including the FOIL method.**
- ✓ **A.SSE.1.a./E.1.b: I can factor trinomials that are in the form of $x^2 + bx + c$.**
- ✓ **A.SSE.1.a./E.1.b: I can factor trinomials that are in the form of $x^2 + bx + c$, when the lead coefficient is NOT a 1.**
- ✓ **A.SSE.1.a/E.1.a.: I can factor perfect square trinomials**
  - **I can factor the difference of two squares.**
- ✓ **A.SSE.1.a./E.1.b.: I can factor polynomial expressions using grouping.**

#1. Consider this expression: $3x + 5y - 6x^3 - 18y + 12x^3$

a. Simplify the expression. ***Write the expression in standard form.***

b. What is the ***degree*** of the expression?

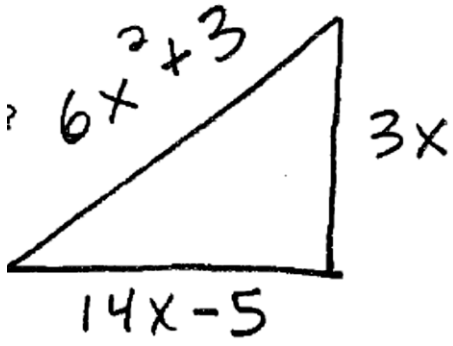
#2. Simplify the following:

(6p + 2n)[(-3p + 5n) – (8p – 2n)]

#3. What is the **degree** of the monomial $5x^4y^5$?

#4. What is the **GCF** of the terms $7d^3 + 21d^2 + 14d$?

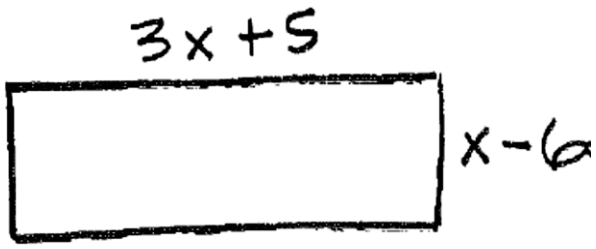
#5. What expression represents the **perimeter** of this triangle?



#6. A college campus has a rectangular flower garden with these dimensions.

What expression describes the area of the flower garden?

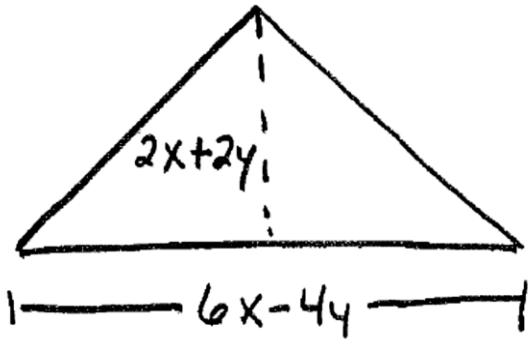
A = l · w



#7. A landscape architect designed a triangular banner with these dimensions.

What expression describes the area of the banner?

A = ½ b · h



#8. What is the complete factorization of the expression: $x^2 - 25$?

#9. A person designed a box in the shape of a rectangular prism. Its width was 5xy. Its length is x + 2y and its height is x + 4y.

What expression describes the volume of the box?

V = l·w·h

#10. A rectangular paved area with a length of 4x and a width of 6x has been erected inside a rectangular field that has a length of 14x and a width of 9x.

a. What is the area of the field?

A = l · w

b. What is the area of the part of the field that is NOT blacktop?

c. What is the perimeter of the field and of the paved area?

#11. Completely factor $x^2 - x - 56$.

#12. The area of a garden is given by the trinomial $z^2 - 4z - 45$. The garden's length is z + 5. What is the garden's width?

#13. The area of a rectangular swimming pool $14x^2 + 16x - 24$.
The length of the pool is 2x + 4. What is the width of the pool?

#14. What is the ***factored form*** of $16x^2 - 100$?

#15. What is the ***complete factorization*** of $3x^2y - 12xy - 135y$?

#16. What is the ***factored form*** of $6x^3 + 2x^2 + 12x + 4$?

#17. The polynomial $2\pi x^3 + 14\pi x^2 + 24\pi x$ represents the volume of a cylinder. The formula for the volume of a cylinder with radius 'r' and height 'h' is: $\boldsymbol{V = \pi r^2 h}$.

Factor: $\boldsymbol{2\pi x^3 + 14\pi x^2 + 24\pi x}$.

Factor each polynomial.

#18. $36fg^2 + 54f^2g^4$ #19. $8s^8t^4 + 20s^4t^3$ #20. $12a^2b^5 + 156a^2b^3$

#21. A pizza shop owner is monitoring the amount of cheese he uses each week. The polynomials below model the pounds of cheese ordered in the past, where *p* represents pounds.

Mozzarella: $3p^3 - 6p^2 + 14p + 125$

Cheddar: $12.5p^2 + 18p + 75$

Write a polynomial that models the total number of pounds of cheese that were ordered.

Factor each trinomial:

#22. $121n^2 - 66n + 9$ #23. $81x^2 - 18x + 1$ #24. $25m^2 - 60m + 36$

#25. $12n^2 - 36n + 27$ #26. $180a^2 - 300a + 125$ #27. $250k^2 - 200k + 40$

Determine the number that goes in each box:

#28. $a^2 - 13a + 22 = (a - 2)(a - \square)$ #29. $t^2 + 9t + 14 = (t + 2)(t + \square)$

#30. $d^2 + 11d + 30 = (d + 5)(d + \square)$ #31. $v^2 + 2v + 1 = (v + 1)(v + \square)$

#32. $m^2 - 8m + 15 = (m - 5)(m - \square)$ #33. $n^2 + 9n + 18 = (n + 3)(n + \square)$

Factor each:

#34. $s^2 - 5s - 24$ #35. $w^2 + 2w - 8$ #36. $z^2 + 3z - 40$

#37. $d^2 - 4d - 12$ #38. $p^2 - 7p - 8$ #39. $r^2 + 3r - 10$

#40. $f^2 + 11f + 24$ #41. $c^2 + 12c + 27$ #42. $d^2 + 6d + 5$

#43. $e^2 + 15e + 54$ #44. $b^2 + 10b + 16$ #45. $x^2 + 7x + 10$

#46. MULTIPLE CHOICE:

Which expression is a perfect square trinomial?

A. $121x^2 + 66x + 9$

B. $144x^2 + 60x + 25$

C. $169x^2 + 208x + 16$

D. $125x^2 + 200x + 16$

MULTIPLE CHOICE:

#47. F.1.b./A.SSE.2 What is the factored form of: $2x^3 + 5x^2 - 12x$?

a. (x + 4) (2x – 3)
b. x (x + 4)(2x – 3)
c. (x – 4) (2x + 3)
d. x(x – 4)(2x + 3)

#48. Factor the following: $8x^2 - 128x^6$

#49. Define a variable, write an inequality, solve it, graph it and write its corresponding interval.

"Twelve is at most a number decreased by seven."

#50. Define a variable, write an inequality, solve it, graph it, and write its corresponding interval.

"Eighteen is at least a number increased by twenty-seven."

Find the domain of the following equations:

#51. $y = \frac{6 + x}{x - 8}$

#52. $y = \frac{x+10}{11 + x}$

#53. The point (-7, -12) is on the graph of a linear equation. Another point on the graph of the same equation can be found by going 21 units up and 29 units to the right from (-7, -12).

a. What is the ***slope*** of the line represented by the equation?
b. Write the equation of the line in **point-slope form**.
c. Write the equation in **slope-intercept form**.
d. Write the equation in **standard form**.
e. Consider the slope that you calculated. What would be the slope of a line ***parallel*** to that line?
f. Consider the slope that you calculated. What would be the slope of a line ***perpendicular*** to that line?
g. Write an equation in **standard form** that would be **parallel** to the equation you calculated.
h. Write an equation in **slope intercept form** that would be **perpendicular** to the equation you calculated.

QualityCore® Reference Sheet
Algebra I

Equations of a Line

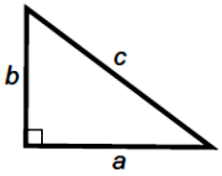
Standard Form	$Ax + By = C$	A, B, and C are constants with A and B not both equal to zero.
Slope-Intercept Form	$y = mx + b$	(x_1,y_1) is a point.
Point-Slope Form	$y - y_1 = m(x - x_1)$	m = slope b = y-intercept

Quadratics

Standard Form of a Quadratic Equation	$ax^2 + bx + c = 0$	a, b, and c are constants, where $a \neq 0$.
Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	

Pythagorean Theorem

$a^2 + b^2 = c^2$



Circles

Equation of a Circle	$(x - h)^2 + (y - k)^2 = r^2$	center (h,k)
Area	$A = \pi r^2$	A = area r = radius
Circumference	$C = \pi d$	C = circumference d = diameter $\pi \approx 3.14$

Sequence and Series

Arithmetic Sequence	$a_n = a_1 + (n - 1)d$	$a_n = n^{th}$ term
Arithmetic Series	$s_n = \frac{n}{2}(a_1 + a_n)$	n = number of the term d = common difference s_n = sum of the first n terms

Miscellaneous

Distance, Rate, Time	$D = rt$	D = distance r = rate t = time I = interest p = principal A = amount of money after t years n = number of times interest is compounded annually k = variation constant
Simple Interest	$I = prt$	
Compound Interest	$A = p\left(1 + \frac{r}{n}\right)^{nt}$	
Direct Variation (y varies directly with x)	$y = kx$	
Indirect Variation (y varies indirectly with x)	$y = \frac{k}{x}$	

Area and Volume of Polygons and Solids

Triangle	$A = \frac{1}{2}bh$	A = area b = base h = height V = volume B = area of base r = radius $\pi \approx 3.14$
Parallelogram	$A = bh$	
Trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$	
General Prism	$V = Bh$	
Right Circular Cylinder	$V = \pi r^2 h$	
Pyramid	$V = \frac{1}{3}Bh$	
Right Circular Cone	$V = \frac{1}{3}\pi r^2 h$	
Sphere	$V = \frac{4}{3}\pi r^3$	

Lines and Points

Slope	$m = \frac{y_2 - y_1}{x_2 - x_1}$	(x_1,y_1) and (x_2,y_2) are 2 points. m = slope M = midpoint d = distance
Midpoint	$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$	
Distance	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	