Algebra 1 Review

Part A Find the value of each expression below – NO Calculator!

1) $(-7)^2$

2) -7^2

3) $4\frac{1}{8} \div -6\frac{3}{4}$

4) $\dfrac{459 + 281}{287 - 37}$

5) $3\frac{2}{5} - 5\frac{1}{2}$

6) $12 \div 2 - 5 \cdot 3$

7) $12 - 5 + 6 - 2$

8) $24 \div (-6) \cdot 4$

9) $-8 \cdot 3 - 12 \div 4$

10) $(1 + 7)^2 - 2(8 - 15)^2$

11) $(18 \div 2 + 1) - (15 - 10 \div 2)$

12) $|-5| - |-3|$

13) $3 + 2\left[15 + 4\left(7 - 2^1\right)\right]$

14) $-5\left[6^2 \div 4 + (13 - 5 \cdot 2)^2\right]$

Part B Evaluate the Following if x = 3, y = -2 and z = 5

1) $3z - x + y$

2) $x^2 - y^2$

3) xy^2

4) $(x + z)^2$

5) $z^2 - 5(-x - y)$

6) $\dfrac{-3z + 2x}{-5x}$

7) $-y^2 - 2x^2 + z^2$

Part C Decide if each statement is TRUE or FALSE. If the statement is false, put in one more sets of grouping parentheses to make the statement true.

1) $18 \div 6 + 3 = 2$

2) $20 \div 5 - 2 \cdot 1 = 2$

3) $20 - 6 + 5(2) = 4$

4) $1 + 4 \cdot 3^2 = 45$

Part D Simplify each expression below. If it cannot be simplified, please state this.

1) $2x + 6x$

2) $2x + 6y$

3) $4m - 6m - 10m$

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

5) $(8y)(6x)(2z)$

6) $8 + 6x - 10 + 3(2x - 5)$

7) $8 + 9m + 10$

8) $8 \cdot 9m \cdot (-10)$

9) $-6(4 - 5y) - 20y$

10) $\dfrac{8y - 12}{4}$

11) $18z - 14 - 2z - 22$

12) $-3a^2 + 2b - 3c^3 + 5a^2$

Part E Use the distributive property to simplify each expression below.

1) $13(2x + 10)$

2) $-5(m - 8)$

3) $(5m + 2)3$

4) $15(2m - 3n)$

5) $2y - 2(y + 5)$

6) $-11(2 - y)$

7) $8y + (4 - 5y)6 - 15$

8) $(2q + 8)-2$

9) $(2 + 3y) - (2 - 3y)$

10) $\dfrac{3}{4}(12y - 20) - \dfrac{1}{2}y$

11) $7(y + 2) - 3(2y - 5)$

12) $8y - 4(6 - 2y)$

13) $8 + 4(3m - 2)$

14) $12 - 3(4a + 2) - 6$

15) $8m - (5 - 3m) - 6$

16) $-5(6y + 2) - 13y + (-3)^3$

17) $6(2m + 3) + 4^2 - 6(2 + 3)^2$

Part F Solve each equation

1) $-7 = 4 - (-x)$

2) $\dfrac{2}{5}x = -\dfrac{10}{13}$

3) $\dfrac{2}{3}x + 5 = 13$

4) $2x - 4(3 - x) = 18$

5) $-21d + 15 = -5d + 7$

6) $6(2 - x) + 4x = -5(x + 3)$

7) $2.07x + 14.75 = 4.21x - 5.901$

8) $2x - 5x + 11 = 2 - 3x + 9$

9) $-3(2x + 5) = -(15 - 6x)$

10) $-4y - (5y + 6) = -7y + 3$

11) $6x - 8 = -3(2x - 4)$

12) $5x + 3 - 2x = 3(x + 2)$
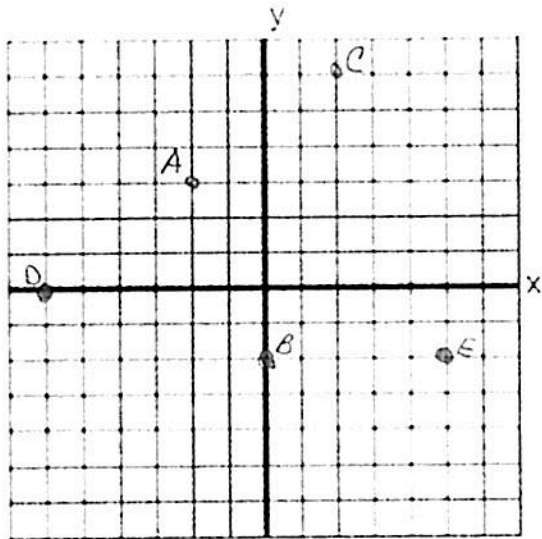
Part G Solve for the indicated variable

1) $5a + b = c$, solve for a

2) $-8pq = 4rs$, solve for p

3) $S = B + \dfrac{1}{2}Pl$, solve for l

4) $V = \dfrac{1}{3}\pi r^2 h$, solve for h

Part H Name the coordinates of the points graphed below. Identify in what quadrant or what axis the points are located.

A_____

B_____

C_____

D_____

E_____

Consider the equation $3x - 2y = \dfrac{1}{2}(4x + 6)$. Complete the following coordinates.

1) $\left(?, \dfrac{1}{4}\right)$

2) $(3, ?)$

3) $\left(-\dfrac{2}{3}, ?\right)$

Identify the slope and y – intercept of the following equations.

4)　　$y = \frac{1}{2}x + 5$

5)　　$4x + 3y = 15$

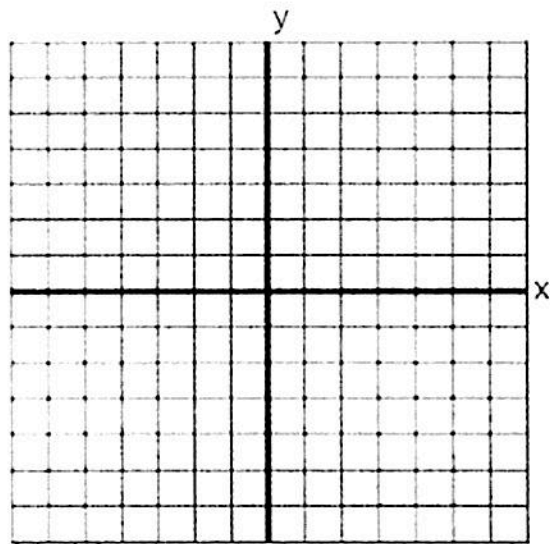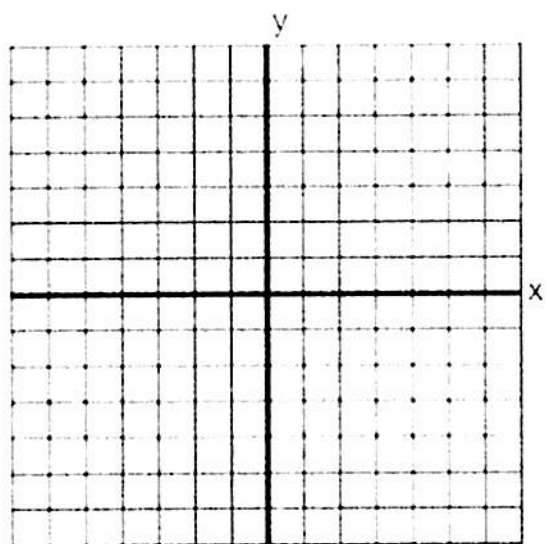Find the slope between each pair of points.

6)　　(-5, 12) and (7, 3)

7)　　(5, 12) and (5, - 5)

8)　　Find the value of x so that the slope between the points (x, -2) and (4, 3) $= \frac{5}{6}$

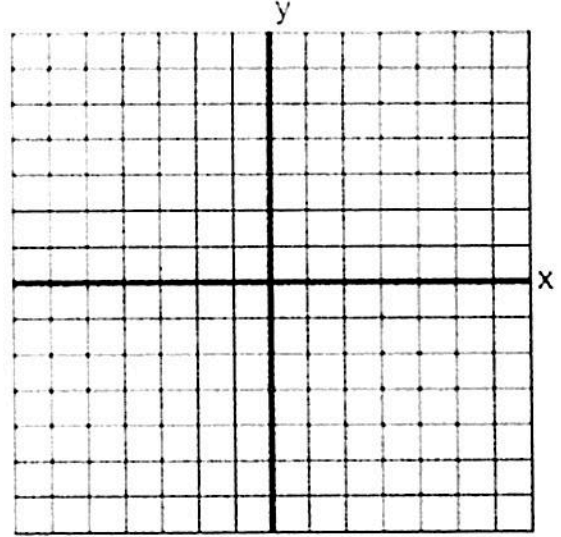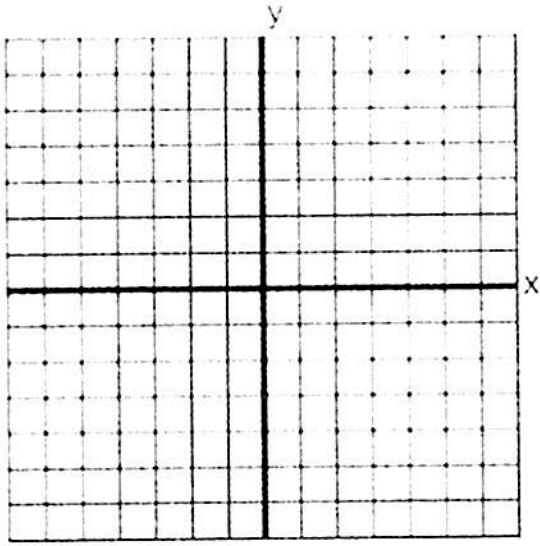Graph the following equations using whichever method you choose.

9)　　$2x - 3y = 6$　　10)　　$2x - y = 2x + 8$
　　　　　(graph 9 and 10 on same graph)

11)　　$2(x + 3) = 12$　12)　　$y = 4 - 3x$
　　　　　(graph 11 and 12on same graph)

13)   6y = 3x – 12   14)   5x = 2y + 8   15) 4y – 4x = 0   16) 3(2y – 3) = - 3
       (graph 13 and 14 on same graph)   (graph 13 and 14 on same graph)

Part I – Write the equation of the lines in the form requested.

In slope intercept form if
1) if m = 3 and b = -2   2)   m = 1/6 and b = 5   3) m = 0, b = -7

In slope intercept form that is Parallel to the given line and passing through the given point.

4) $y = -\frac{1}{4}x - 1$ through (4,1)   5)   3x + y = 9 and through (3, -2)

In point slope form that is Perpendicular to the given line and passes through the given point.

6) y = 4x – 6 through (-8,3)   7)   3x – 2y = - 8 and through (3, -4)

Write the equation of the line through the 2 given points(any form is ok)

8)   (1, 4) and (5, 7)   9)   (-3, -3) and (7,2)   10)   (8,-2) and (4, -2)

Part J Solve each of the inequalities/equations

1) $6y - 7 < -2y + 13$

2) $9 \leq 6 - b \leq 12$

3) $|2h + 1| \geq 5$

4) $4 + 2n \geq 1$ or $-5n > 25$

5) $|3x - 5| \geq 10$

6) $|4 - 2x| - 7 < 12$

Solve the following equations

7) $|4k - 3| = 11$

8) $|3c + 1| - 4 = 13$

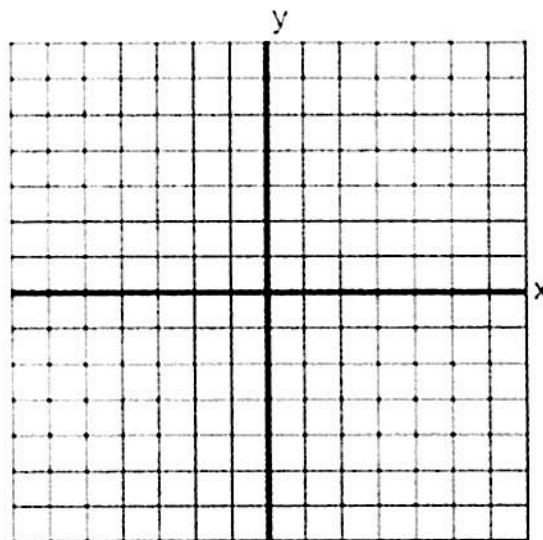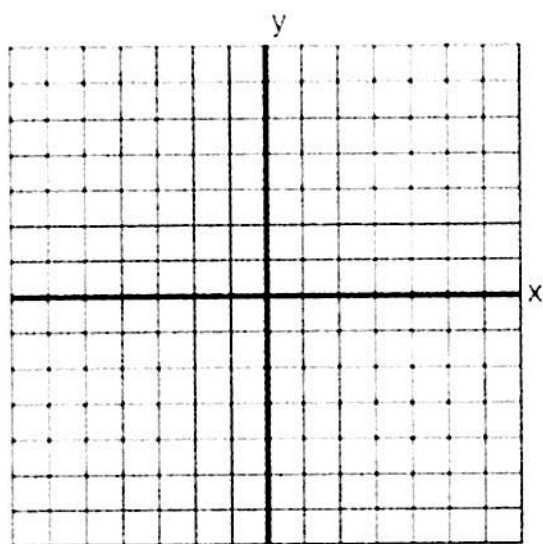Graph the following on a number line.

9) $x < 5$ or $x > 8$

10) $x < 3$ and $x \geq 0$

11) $-10 \leq x < -5$

Graph the following inequalities on a coordinate plane.
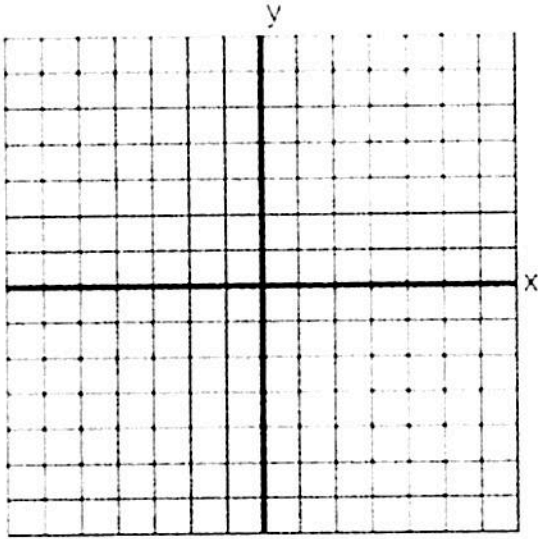
12) $-2x - 3y < 12$

13) $y \geq \frac{2}{5}x + 1$

Part K Systems of Equations

1) Solve by Graphing

$2x - y = 5$
$y = 5 - 3x$

2) Solve by Substitution

$10x + y = 5$
$5x + 4y = 6$

3) Solve by Linear combinations(elimination)

$6x - 4y = 9$
$8x + 3y = -13$

4) Solve by any method

$4x - y = 6$
$2x = \frac{1}{2}y + 3$

5) Solve by any method

$3y = 7x - 1$

$2y - \frac{14}{3}x = 5$

6) Solve by any method

$\frac{1}{3}x = \frac{1}{2}y - 16$

$x + y = 7$

7) You have a handful of 30 coins, all nickels and dimes. If you have a total of $2.00, how many of each type do you have.

8) A rectangle has length that is three less than twice the width. Find the length and width if the perimeter of the rectangle is 48 cm.

9) The larger of two number is 4 more than 3 times the smaller. The sum of the two numbers is 28. Find the numbers.

Part L Simplify the following, leave no negative exponents in your answer.

1) $\left(3x^5\right)^2$

2) $3\left(x^5\right)^2$

3) $5\left(-xy^2\right)^3$

4) $4x^{-2} \bullet -3x^5$

5) $4x^3y^4 \bullet -6x^5y$

6) $\left(4x^3y^4\right)^3$

7) $\left(\dfrac{15x^3}{12x^8}\right)^2$

8) $\dfrac{-4x^2}{y^{-3}}$

9) $\left(3x^2y^{-1}\right)^{-2} \bullet \left(-5x^{-3}y^2\right)^4$

10) $\dfrac{18x^5y^{-3}}{12x^{-2}y^6}$

11) $\left(\dfrac{-4x^{-3}}{3y^2}\right)^{-3}$

12) $\dfrac{25x^{-1}y^2}{2x^3y^5} \bullet \dfrac{8x^{-5}y}{10x^{-3}y^2}$

13) $\left(\dfrac{xy^{-5}}{3x^{-2}y^{-3}}\right)^2 \bullet \dfrac{12x^2y}{x^4y^5}$

Part M Perform the indicated operation

1) $\left(8x^4 + 11\right) + \left(12x^4 + x - 10\right)$

2) $\left(-2t^3 + 4t^2 - 4\right) - \left(5t^3 + 7t^2 + t + 6\right)$

3) $(r - 2)(3r + 4)$

4) $(2y - 7)(3y + 1)$

5) $(6x - 9)(x - 2)$

6) $(2x + 3)^2$

7) $(2x + 5)(7x^2 - 3x - 4)$

8) $(4x - 3)(4x + 3)$

Factor each expression completely

1) $5x^2y^3 + 30xy^4$

2) $x^2 - 7x - 8$

3) $4n^2 + 4n + 1$

4) $16y^2 - 49$

5) $2x^2 + 3x + 9$

6) $3y^2 - 8y - 3$

7) $24x^2 - 30$

8) $9x^2 + 16$

9) $7z^2 - 28$

10) $2x^3 + 2x^2 - 24x$

11) $36x^2 - 64$

12) $x^2 - 8x - 48$

Part N Solve each equation –

By Factoring   1) $3x^2 + 18x = 0$ 2) $3x^2 + 8x - 4 = 12$

3) $x^2 - 2x - 3 = 0$ 4) $36x^2 - 9 = 0$

Solve using the quadratic formula

5) $5x^2 + 2x - 1 = 0$ 6) $3x^2 - 7x + 2 = 0$

Part O Simplify each radical

1) $\sqrt{250}$ 2) $6\sqrt{8} \cdot 7\sqrt{2}$ 3) $-2\sqrt{6} \cdot 7\sqrt{30}$

4) $5\sqrt{\dfrac{11}{16}}$ 5) $4\sqrt{8} + 5\sqrt{2}$ 6) $\dfrac{4\sqrt{3}}{\sqrt{2}}$

7) $5\sqrt{40}$ 8) $\dfrac{8 + \sqrt{8}}{4}$ 9) $\left(4\sqrt{3}\right)^2$

Answers

Part A
1) 49   2) -49   3) -11/18   4) 74/25   5) -21/10   6) -9   7) 11   8) -16
9) -27   10) – 34   11) 0   12) 2   13) 25   14) – 90

Part B
1) 10   2) 5   3) 12   4) 64   5) 30   6) -9/10   7) 3

Part C
1) False $18 \div (6+3) = 2$ 2) True   3) False $20 - (6 + 5(2)) = 4$ 4) False $(1+4) \cdot 3^2 = 45$

Part D
1) 8x   2) done   3) – 12m   4) -30x^2 5) 96xyz   6)   12x – 17   7) 9m + 18
8) – 720m   9) 10y - 24   10)   2y – 3   11)   16z – 36   12)   -3c^3 + 2a^2 + 2b

Part E
1)   26x + 130   2)   - 5m + 40   3) 15m + 6   4) 30m – 45n   5) -10
6)   11y   - 22   7) -22y + 9   8) -4q – 16   9) 6y   10)   8.5y – 15   11) y + 29
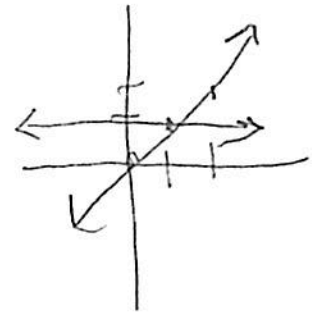12) 16y – 24   13) 12m   14) -12a   15) 11m – 11   16) -43y – 37   17) 12m – 116
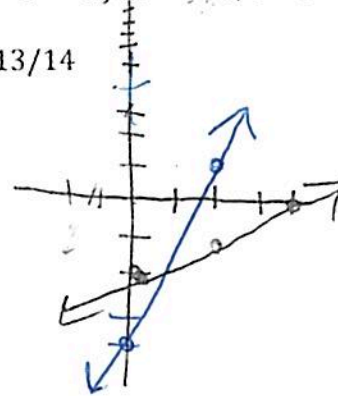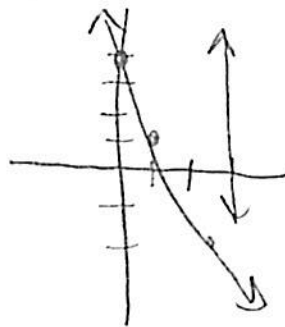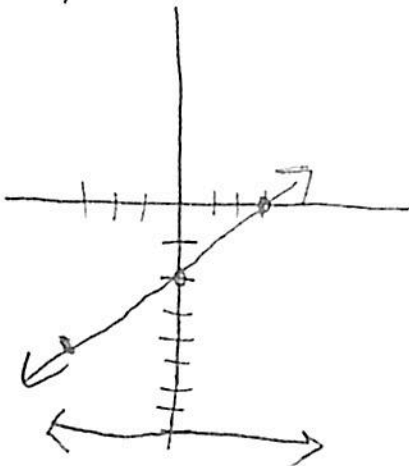
Part F
1) x = -11   2) z = -25/13   3) x = 12   4) x = 5   5) d = ½   6) x = - 9
7) x = 9.695   8)   any real number   9) x = 0   10)   y = - 4.5   11) x = 5/3
12) no solution

Part G
1) a = (c-b)/5   2) p = - rs/2q   3) l = 2(S – B)/P   4)   h = 3V/ π r^2

Part H
A) (-2,3), 2nd quad   B) (0,-2) y-axis   C) (2,6) 1st quad   D) (-6,0) x-axis   E) (5, -2) 4th quad
1) x = 3.5   2) y = 0   3) y = -11/6   4) m = -1/2, b = 5   5) m = -4/3, b = 5   6) m = -3/4
7) m = undefined   8) x = -2
9/10   11/12   13/14   15/16
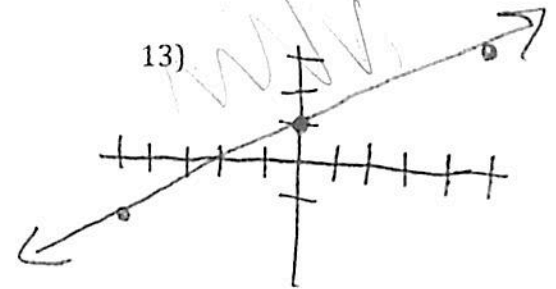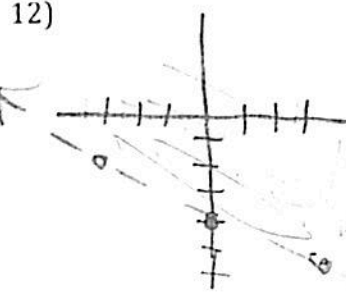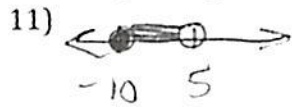
Part I

1) $y = 3x - 2$ 2) $y = 1/6x + 5$ 3) $y = -7$ 4) $y = -1/4x + 2$ 5) $y = -3x + 7$

6) $y - 3 = -1/4(x + 8)$ 7) $y + 4 = 2/3(x - 3)$ 8) $y - 4 = \frac{3}{4}(x - 1)$ or $y - 7 = \frac{3}{4}(x - 5)$ or $y = \frac{3}{4}x - 3\frac{1}{4}$

9) $y + 1/2x - 1.5$ or $y + 3 = \frac{1}{2}(x+3)$ or $y - 2 = \frac{1}{2}(x - 7)$ 10) $y = -2$

Part J

1) $y < 5/2$ 2) $-3 \geq b \geq -6$ 3) $h \geq 2$ or $h \leq -3$ 4) $n > -3/2$ or $n < -5$ 5) $x \geq 5$ or $x \leq -5/3$

6) $x > -7.5$ and $x < 11.5$ 7) $k = 3.5$ or $k = -2$ 8) $c = 16/3$ or $c = -6$

9)
$5 \quad 8$

10)
$0 \quad 3$

11)
$-10 \quad 5$

12)

13)

Part K

1) $(2, -1)$ 2) $(2/5, 1)$ 3) $(-1/2, -3)$ 4) infinite # of solutions   5) no solutions 6) $(-15, 22)$

7) 10 dimes, 20 nickels   8) $W = 9, L = 15$ 9) Large = 22, small = 6

Part L

1) $9x^{10}$ 2) $3x^{10}$ 3) $-5x^3y^6$ 4) $-12x^3$ 5) $-24x^8y^5$ 6) $64x^9y^{12}$ 7) $25/16x^{10}$

8) $-4x^2y^3$ 9) $625y^{10}/9x^{16}$ 10) $\frac{3x^7}{2y^9}$ 11) $27x^9y^6/-64$ 12) $10/x^6y^4$ 13) $4x^4/9y^8$

Part M

1) $20x^4 + x + 1$ 2) $-7t^3-3t^2-t-10$ 3) $3r^2-2r-8$ 4) $6y^2-19y-7$ 5) $6x^2-21x+18$

6) $4x^2 + 12x + 9$ 7) $14x^3 + 29x^2 - 23x - 20$ 8) $16x^2 - 9$

1) $5xy^3(x + 6)$ 2) $(x - 8)(x + 1)$ 3) $(2n + 1)(2n + 1)$ 4) $(4y - 7)(4y + 7)$

5) does not factor 6) $(3y + 1)(y - 3)$ 7) $6(4x^2 - 5)$ 8) doesn't factor   9) $7 (y - 2)(y + 2)$

10) $2x(x + 4)(x - 3)$ 11) $4(3x - 4)(3x + 4)$ 12) $(x - 12)(x + 4)$

Part N

1) $x = 0, -6$ 2) $x = -4, 4/3$ 3) $x = 3, -1$ 4) $x = \frac{1}{2}, -1/2$ 5) $x = \dfrac{-1 \pm \sqrt{6}}{5}$ 6) $x = 2, 1/3$

Part O

1) $5\sqrt{10}$ 2) 168   3) $-84\sqrt{5}$ 4) $\dfrac{5\sqrt{11}}{4}$ 5) $13\sqrt{2}$ 6) $2\sqrt{6}$ 7) $10\sqrt{10}$

8) $\dfrac{4 + \sqrt{2}}{2}$ 9) 48