CE 1340 Summer Math Packet

The following packet is intended to help you prepare for math in the upcoming school year. Work through it during your summer break, pacing yourself by spending around 20-30 minutes per week solving various problems. Try your best to complete the work without using a calculator. This packet will be graded, and you will be tested on these topics during the first week of school.

1. Express in simplest radical form.

a. $\sqrt{192}$	b. $\sqrt{125}$	c. $\sqrt{48}$	d. $\sqrt{-900}$
e. $\sqrt{81}$	f. $\sqrt{-27}$	g. $\sqrt{54}$	h. $\sqrt{147}$
i. $\sqrt{150}$	j. $\sqrt{24}$	k. $\sqrt{-288}$	l. $\sqrt{49}$
m. $\sqrt{-112}$	n. $\sqrt{-162}$	o. $\sqrt{160}$	p. $\sqrt{432}$

2. Evaluate the expressions shown below and express your answers as proper or improper fractions in simplest form.

a. $\frac{9}{7} - \frac{7}{10}$	b. $\frac{5}{2} - \frac{4}{11}$	c. $\frac{3}{10} \times \frac{5}{8}$	d. $\frac{5}{4} \div \frac{7}{12}$	e. $\frac{5}{12} - \frac{5}{8}$	f. $\frac{5}{12} + \frac{4}{15}$
g. $\frac{9}{2} \times \frac{8}{3}$	h. $\frac{1}{9} - \frac{-7}{6}$	i. $\frac{6}{19} - \frac{10}{19}$	j. $\frac{4}{9} \div \frac{11}{9}$	k. $\frac{-1}{12} + \frac{7}{15}$	l. $\frac{9}{-4} \div \frac{9}{16}$
m. $\frac{-4}{5} \cdot \frac{11}{3}$	n. $\frac{1}{3} + \frac{-1}{24}$	o. $\frac{7}{-20} + \frac{-9}{8}$	p. $-\frac{3}{16} - \frac{11}{20}$	q. $\frac{-9}{10} \times \frac{-1}{-100}$	r. $\frac{11}{-8} \div \frac{12}{10}$

3. Solve the equations for all values of x by **completing the square**.

a. $x^2 + 16x = -63$	b. $x^2 + 10x + 21 = 0$	c. $x^2 + 24 = 10x$
d. $x^2 - 8x = 9$	e. $-18x = x^2 + 80$	f. $2x^2 - 16x = -24$
g. $3x^2 - 60 = 24x$	h. $5x^2 - 20x = 300$	i. $240 = 4x^2 - 16x$

4. Factor each of these trinomials. Show all of your work.

a. $x^2 - 3x - 28$	b. $x^2 + 13x + 30$	c. $x^2 + 7x + 6$
d. $-5x^2 + x + 6$	e. $3x^2 + 19x + 28$	f. $-6x^2 - 7x + 3$
g. $-x^2 + 3x + 28$	h. $4x^2 + 12x + 5$	i. $6x^2 + 17x + 5$

5. Express the following fractions in simplest form using only positive exponents.

a. $\frac{3p^3}{2(p)^2}$	b. $\frac{(5x^3)^2}{15x^2}$	c. $\frac{4p^4}{3(p^3)^3}$	d. $\frac{15p^7}{(3p^3)^2}$
e. $\frac{-12h^{-4}}{(4h^{-5})^4}$	f. $\frac{5r^{-1}}{4(r^{-1})^2}$	g. $\frac{-5q^{-4}}{(-5q^4)^2}$	h. $\frac{(4n)^2}{-4n^{-5}}$
i. $\frac{3b^{-9}}{(3b^{-4}c^{-3})^{-3}}$	j. $\frac{4(v^{-1}s^{-1})^{-1}}{2v^{10}s^{-1}}$	k. $\frac{10v^3t^{-5}}{(2v^2t^{-2})^{-5}}$	l. $\frac{12x^{-2}}{(3p^{-1}x^{-5})^{-3}}$

6. Solve the following logarithm problems for the solution for x.

a. $log_{36}x = \frac{1}{2}$	b. $log_{x}\frac{1}{125} = -\frac{3}{4}$	c. $log_3(3x) - log_3(6) = 0$
d. $-3log_8(x) + 12 = 14$		e. $8log_8(x) - 16 = 8$
f. $log_5(x - 4) = 1 - log_5(2x - 5)$		g. $log_4(4x + 1) + log_4(4x + 1) = 2$
h. $5ln(4x - 9) + 7 = -8$		i. $6ln(7x - 8) + 8 = 50$

7. Factor completely.

a. $-48x^4y^3z^2 - 42y^2$	b. $-15x^3 + 5$	c. $9x^2 - 49$	d. $49x^2 - 121$
e. $x^3 + 2x^2 - 3x - 6$		f. $4x^3 - 8x^2 - 25x + 50$	
g. $3x^3 - 18x^2 + 24x$	h. $39x^2 - 126x - 3x^2$	i. $90x - 8x^2 - 2x^3$	
j. $-14x^2 + 7x^4$	k. $-s^3 + 3s^2 + 9s - 27$		l. $81 - 4x^2$

8. Solve the following system of equations algebraically. Write your solutions as coordinate points.

a. $y = x^2 - 8x - 45$ $y = -3x + 5$	b. $y = x^2 + 8x - 20$ $y = -x - 10$
c. $y = -2x^2 - 17x - 26$ $10 = x - y$	d. $y = 3x^2 + 10x + 4$ $y = 2x - 1$
e. $x^2 + (y - 4)^2 = 90$ $x + 2y = -7$	f. $(x + 3)^2 + y^2 = 74$ $3x + y = 7$

9. Find the inverse function of the following functions.

a. $f(x) = 8x + 9$	b. $g(x) = \frac{9}{4x}$	c. $h(x) = \frac{7x}{5}$
d. $k(x) = 7(x + 1)^5 - 3$	e. $f(x) = 5x^3 + 5$	f. $g(x) = \frac{1}{5}x + 3$

10. Simplify the following radicals. Try to figure it out without a calculator.

a. $\sqrt[4]{81}$	b. $\sqrt[3]{216}$	c. $\sqrt[4]{16}$	d. $\sqrt[3]{125}$
e. $\sqrt[4]{256}$	f. $\sqrt[3]{8}$	g. $\sqrt[3]{27}$	h. $\sqrt[3]{64}$
i. $\sqrt[5]{32}$	j. $\sqrt[4]{10000}$	k. $\sqrt[3]{343}$	l. $\sqrt[5]{243}$