H.O.T. problem #1:

Write two complex numbers $a + bi$ (where neither a nor b is zero) with a product of 34.

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H.O.T. problem #2:

Which expressions are equivalent to -1?

a) i^2

b) i^3

c) $1 + i^2$

d) $(i^5)(i)$

e) $i - 3 - 4i^2$

f) $1 - i^3 + 2i^2 - i$

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H.O.T. problem #3:

I am thinking of two complex numbers (where neither a nor b is zero) with a sum of $3 + i$ and a difference of $-5 + 7i$. Find the product of the two numbers.

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H.O.T. problem #4:

Find integers a, b, c, d such that:

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H.O.T. problem #5:

Write a standard form quadratic with the solution:

$$\frac{9 \pm \sqrt{249}}{14}$$

Write a standard form quadratic with the solution:

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H.O.T. problem #6:

Find values of k so that the equation has (this is three separate questions):

- 1 real solution
- 2 real solutions
- 2 imaginary solutions

for the quadratic $x^2 - 2kx + k = 0$

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H.O.T. problem #7:

Find values of k so that the equation has (this is three separate questions):

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for the quadratic $3kx^2 + 2x + 3k = 0$

H.O.T. problem #7:

Find values of k so that the equation has (this is three separate questions):

- 1 real solution
- 2 real solutions
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for the quadratic $3kx^2 + 2x + 3k = 0$

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H.O.T. problem #2.5:

Simplify $\frac{5-7i}{3i}$ **four** different ways – show out all work!

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H.O.T. problem #1.5: (remember, you shouldn't be using a calculator 😊)

List out the first ten powers of i (so $i, i^2, i^3, \dots, i^{10}$).

What would i^{14} be?

What would i^{19} be?

What would i^{73} be? Please don't count out to 73 for this one – find a rule/pattern!

Now use that pattern to find: $i^{96}, i^{94}, and\ i^{101}$

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