

FFPC Test Outline

The test will still be this Wednesday and cover the main ideas from the FFPC text covering investigations 1, 2 and 4.

1.) Finding the key features of a quadratic equations from a given expanded form. (30 points)

2.) Expanding an expression with two variables (5 points)

3.) Solving quadratic equations using factoring (20 points)

4.) Finding the maximum height, when it occurs and landing time from a given quadratic equations similar to the jumping or shooting type problems from class (15 points)

5.) Factoring expressions completely including ones with a GCF (20 points)

6.) Completing a table from a given equations and then finding 1st and 2nd differences to make a conclusion (10 points)

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1. Find the key features for the graph of $y = x^2 + 4x - 12$. Show or explain how each is found. (worth 30 points)

y-intercept:

line of symmetry:

x-intercepts:

2 shaping points

vertex: (10 points)

x		
y		

2. Write the expression in expanded form: $(5x + 3y)^2$

The image shows a handwritten expansion of the expression $(5x + 3y)^2$ using the FOIL method. The first line shows the expression $(5x + 3y)(5x + 3y)$ with blue arrows indicating the multiplication of the first terms (5x to 5x), the outer terms (5x to 3y), the inner terms (3y to 5x), and the last terms (3y to 3y). The second line shows the resulting terms: $25x^2 + 15xy + 15xy + 9y^2$. The third line shows the simplified expression: $25x^2 + 9y^2 + 30xy$.

$$(5x + 3y)(5x + 3y)$$
$$25x^2 + 15xy + 15xy + 9y^2$$
$$25x^2 + 9y^2 + 30xy$$

3. Solve by factoring.: (10 points each)

a.) $5y^2 - 18y = -9$

$$\begin{array}{r}
 +9 \quad +9 \\
 \text{APE} \quad \hline
 5y^2 - 18y + 9 = 0 \\
 \quad \quad \quad \vee \\
 (5y-3)(y-3) = 0 \\
 \quad \quad \quad \swarrow \quad \searrow \\
 5y-3=0 \quad y-3=0 \\
 +3 \quad +3 \quad \quad \quad \\
 \hline
 5y = 3 \quad +3 \quad +3 \\
 \text{APE} \\
 5 \quad 5 \quad \boxed{y=3} \\
 \hline
 \boxed{y=3/5}
 \end{array}$$

Ans

b.) $12w^2 + 36w = 0$

$$\begin{array}{r}
 12w(w+3) = 0 \\
 \downarrow \quad \quad \downarrow \\
 12w = 0 \quad w+3 = 0 \\
 \boxed{w=0} \quad \quad \quad \begin{array}{r} -3 - 3 \\ \hline \boxed{w=-3} \end{array}
 \end{array}$$

b.) $12w^2 + 36w = 0$

4. A signal flare is fired into the air from a boat. The height h of the flare in feet after x seconds is
 $h = -16x^2 + 96x$

a. How high will the flare travel? When will it reach this maximum height? (10 points)

$$h = 16x(-x + 6)$$

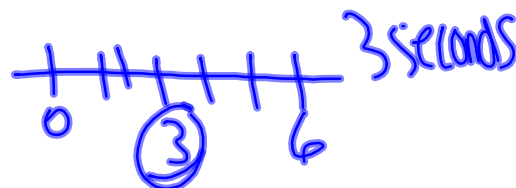
$$\begin{array}{l} \downarrow \\ 16x = 0 \\ x = 0 \end{array}$$

$$\begin{array}{r} -x + 6 = 0 \\ +x \quad +x \\ \hline 6 = x \end{array}$$

$$h = -16(3)^2 + 96(3) =$$

$$LOS = 3$$

$$\downarrow 144 \text{ ft}$$



b. When will the flare hit the water? Briefly explain.

So the flare will hit the water after 6 seconds. This is when the height returns to zero feet.

5. Factor the following expressions completely if possible. If not possible, then write prime and explain how you know. (5 points each)

a.) $x^2 - 9x + 20$

$$(x-4)(x-5)$$

$$b^2 - 4ac = (11)^2 - 4(12)(-15)$$

c.) $12x^2 + 11x - 15$

$$\frac{21+220}{891} = 29$$

~~$$(12x-15)(x+15)$$~~

~~$$(2x-3)(6x-5)$$~~

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

b.) $4x^3 - 400x$

$$\downarrow$$

$$4x(x^2 - 100)$$

$$4x(x-10)(x+10)$$

d.) $a^2 + 2ab + b^2$

$$(a+b)(a+b)$$

$$(a+b)^2$$

d.) $a^2 + 2ab + b^2$

$$(a+b)(a+b)$$

$$a^2 + 2ab + b^2$$

$$(x+5)(x+5)$$
$$x^2 + 10x + 25$$

$$(x+a)(x+a)$$
$$x^2 + 2ax + a^2$$

$$(x-m)^2$$

$$(x-m)(x-m)$$

$$x^2 - 2mx + m^2$$

$$(x+y)^2 ?$$

6. For this problem, use the equation $y = -2x^2 + 3x - 1$.
 Complete this table, then show 1st and 2nd differences, and finally make any conclusions based on the differences. (10points)

x	0	1	2	3	4	5
<i>y</i>						

more practice?

- 1.** A signal flare is fired into the air from a boat. The height h of the flare in feet after t seconds is $h = -16t^2 + 160t$.
 - a.** How high will the flare travel? When will it reach this maximum height?
 - b.** When will the flare hit the water?
 - c.** Explain how you could use a table and a graph to answer the questions in parts (a) and (b).

even more practice?

Completely factor the following expressions if possible, if not possible, then write PRIME and explain how you know.

① $12x^3 + 38x^2 + 6x$

② $35x^3 + 5x^2 - 40x$

③ $4x^2 - 100 =$

④ $16m^2 - 11m - 9 :$

even more practice?

Completely factor the following expressions if possible, if not possible, then write PRIME and explain how you know.

$$\textcircled{1} \quad 12x^3 + 38x^2 + 6x = 2x(6x^2 + 19x + 3) = 2x(6x+1)(x+3)$$

$$\textcircled{2} \quad 35x^3 + 5x^2 - 40x = 5x(7x+8)(x-1)$$

$$\textcircled{3} \quad 4x^2 - 100 = 4(x+5)(x-5)$$

$$\textcircled{4} \quad 16m^2 - 11m - 9 = \text{PRIME}$$
$$b^2 - 4ac = (-11)^2 - 4(16)(-9)$$
$$= 697$$

