SOLUTIONS

1) Factor the following expressions fully. Consider using the flowchart you received as part of your review yesterday.

DOS

a) $x^2 + 24x + 80$

$(\times) 80$
$(+) 24$

$= (x+4)(x+20)$

b) $9x^2 - 4y^2$

$= (3x+2y)(3x-2y)$

c) $2x^2 - 6x + 4$

$(\times) 2$
$(+) -3$

$= 2(x^2 - 3x + 2)$

$= 2(x-1)(x-2)$

d) $5x^2 - 8x - 4$

$(\times) -20$
$(+) -8$

$= 5x^2 - 10x + 2x - 4$

$= 5x(x-2) + 2(x-2)$

$= (x-2)(5x+2)$

e) $4x^2 - 28x + 49$

$\sqrt{4x^2} = 2x$

$\sqrt{49} = 7$

$= (2x-7)^2$

$2(2x)(7) = 28x$ ✓

f) $ed + ef + gf + dg$

$= e(d+f) + g(f+d)$

$= (d+f)(e+g)$

Note: $d+f = f+d$!

g) $5a^7b^6 - 15a^6b^7$

$= 5a^6b^6(a - 3b)$

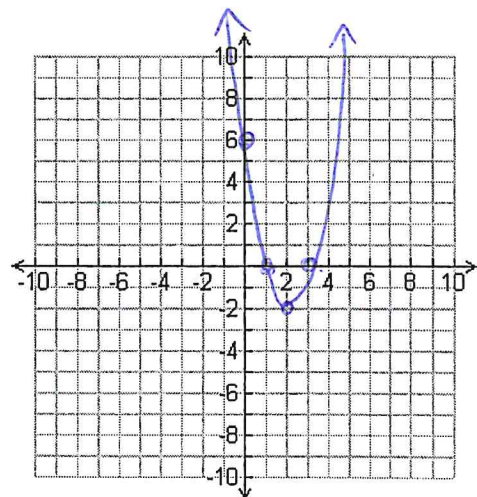2) Consider the quadratic relation $y = 2x^2 - 8x + 6$

a) Plot the y-intercept

b) Factor the relation, and plot the x-intercepts

$y = 2(x^2 - 4x + 3)$

$= 2(x-1)(x-3)$

c) Find the axis of symmetry, and vertex. Then, complete the sketch of this quadratic relation.

AOS: $x = 2$

$y = 2(2-1)(2-3)$

$= 2(1)(-1)$

$= -2$

3 a) Find all values of b so that $x^2 + bx + 10$ can be factored over the integers. Hint: There are 4 values.

To factor, you need 2 numbers that multiply to 10 and add to b. What #s multiply to 10?

$1 \times 10 \rightarrow b = 11$
$2 \times 5 \rightarrow b = 7$
$-1 \times -10 \rightarrow b = -11$
$-2 \times -5 \rightarrow b = -7$

$\left.\right\}$ 4 options.

b) Find all values of b so that $4x^2 + bx + 5$ can be factored over the integers. Hint: There are 6 values.

To factor, you need 2 numbers that multiply to 20 and add to b. What #s multiply to 20?

$1 \times 20 \rightarrow b = 21$ $-1 \times -20 \rightarrow b = -20$
$2 \times 10 \rightarrow b = 12$ $-2 \times -10 \rightarrow b = -12$
$4 \times 5 \rightarrow b = 9$ $-4 \times -5 \rightarrow b = -9$

These are the 6 options for b.

4) Write an algebraic expression for the shaded area. Expand your expression into standard form, then write your expression in factored form by factoring.

$A = (x+1)(x+2) - 3(4)$

$= x^2 + 2x + x + 2 - 12$

$= x^2 + 3x - 10$

$= (x+5)(x-2)$

$\overset{\times}{\bigcirc} -10$
$\overset{+}{\bigcirc} 3$

x + 2

x + 1   3   4