DAY 6 - Mix Practice

1. Review how to expand and simplify.

a. $(y-3)(y+5)$

$= y^2+5y-3y-15$

$= y^2+2y-15$

b. $(x-3y)^2$ $(x-3y)$

$= x^2-3xy-3xy+9y^2$

$= x^2-6xy+9y^2$

c. $(10y+6)(3y+7)-(y+2)(y-4)$

$= (30y^2+70y+18y+42)-(y^2-4y+2y-8)$

$= 30y^2+88y+42-(y^2-2y-8)$

$= 30y^2+88y+42-y^2+2y+8$

$= 29y^2+90y+50$

2. Factor.

a. $2x^2+4x$

$2x\left(\frac{2x^2}{2x}+\frac{4x}{2x}\right)$

$= 2x(x+2)$

b. x^2+6x+9

$(x)(x)$ $1 \cdot 9$ $(3)(3)$

$(x+3)(x+3)$

c. $5x^2+3x$

$x\left(\frac{5x^2}{x}+\frac{3x}{x}\right)$

$= x(5x+3)$

d. $3xy-7xz$

$x\left(\frac{3xy}{x}-\frac{7xz}{x}\right)$

$= x(3y-7z)$

e. $x^2-4x-12$

$(x)(x)$ $1 \cdot 12$ $(2)(6)$ $3 \cdot 4$

$(x+2)(x-6)$

f. $9x^2-16$

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

g. $x^2+12x+35$

$(x)(x)$ $1 \cdot 35$ $(5)(7)$

$(x+5)(x+7)$

h. $49x^2-100$

$(7x+10)(7x-10)$

i. $10x^2+20y^2$

$10\left(\frac{10x^2}{10}+\frac{20y^2}{10}\right)$

$= 10(x^2+2y^2)$

j. $x^2-4x-45$

$(x)(x)$ $1 \cdot 45$ $(5)(-9)$ $3 \cdot 15$

$(x+5)(x-9)$

k. $1-225y^2$

$(1+15y)(1-15y)$

l. $x^2+9x+14$

$(x)(x)$ $1 \cdot 14$ $(2)(7)$

$(x+2)(x+7)$

3. Factor completely

a. $4x^2-28x+40$

$4\left(\frac{4x^2}{4}-\frac{28x}{4}+\frac{40}{4}\right)$

$= 4(x^2-7x+10)$

$(x)(x)$ $1 \cdot 10$ $(-5)(-2)$

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

b. $28a^5-7a^3$

$7a^3\left(\frac{28a^5}{7a^3}-\frac{7a^3}{7a^3}\right)$

$= 7a^3(4a^2-1)$

$= 7a^3(2a+1)(2a-1)$

c. $2y^2-12y+18$

$2\left(\frac{2y^2}{2}-\frac{12y}{2}+\frac{18}{2}\right)$

$= 2(y^2-6y+9)$

$(y)(y)$ $(-3)(-3)$

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

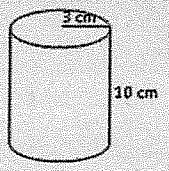
d. $16x^2-64y^2$

$16\left(\frac{16x^2}{16}-\frac{64y^2}{16}\right)$

$= 16(x^2-4y^2)$

$= 16(x+2y)(x-2y)$

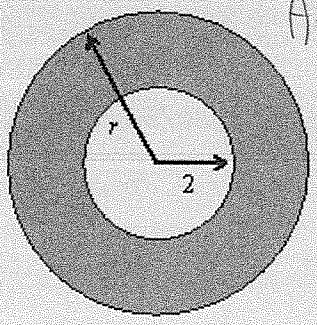
4. Factor the expression for the surface area $SA = 2\pi r^2 + 2\pi rh$



$SA = \frac{2\pi r^2}{2\pi r} + \frac{2\pi rh}{2\pi r}$

$SA = 2\pi r(r + h)$

5. Write an expression, in factored form, for the area of the figure shown below.



$A = \pi r^2 - \pi(2)^2$

$= \pi r^2 - 4\pi$

$= \pi\left(\frac{\pi r^2}{\pi} - \frac{4\pi}{\pi}\right)$

$= \pi(r^2 - 4)$

$= \pi(r+2)(r-2)$

6. The area of a television screen is represented by $x^2 + 3x - 18$. The perimeter is 294 cm. Find the actual dimensions of the TV.

$A = x^2 + 3x - 18$

$x \cdot x$ | $1 \cdot 18$, $2 \cdot 9$, $-3 \cdot 6$

$A = (x-3)(x+6)$

$w \quad l$

$P = 2l + 2w$

$294 = 2(x+6) + 2(x-3)$

$294 = 2x + 12 + 2x - 6$

$294 = 4x + 6$

$288 = 4x$

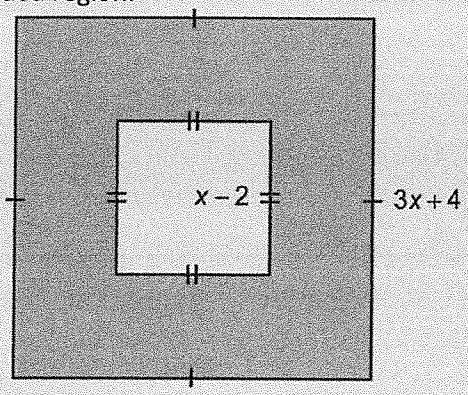
$72 = x$

$\therefore L = x + 6 \qquad W = x - 3$

$= 72 + 6 \qquad = 72 - 3$

$= 78$ cm $\qquad = 69$ cm

7. Find an algebraic expression for the area of the shaded region.



a) Write it in expanded form
b) Write it in factored form.

(a) $A = \square - \square$

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

$= (9x^2 + 12x + 12x + 16) - (x^2 - 2x - 2x +$

$= 9x^2 + 24x + 16 - (x^2 - 4x + 4)$

$= 9x^2 + 24x + 16 - x^2 + 4x - 4$

$= 8x^2 + 28x + 12$

(b) $4(2x^2 + 7x + 3)$