Name: _____ **Chapter 3 Practice Test – Products and Factors**

Show all of your work for full marks.

1. Factor each polynomial.

a) $9a^2+12a^3$

$3a^2(3+4a)$

b) $3x^2+6x^4$

$3x^2(1+2x^2)$

c) $25x^3y+15x^4y^3-30x^2y^2$

$5x^2y(5x+3x^2y^2-6y)$

d) $-4r^2s^2+12r^2s^3-36rs^2$

$-4rs^2(r-3rs+9)$

2. Factor each trinomial.

a) $t^2+10t+21$

$\_\_ \times \_\_ = 21$
$\_\_ + \_\_ = 10$

$(t+7)(t+3)$

b) $v^2-11v+24$

$\_\_ \times \_\_ = 24$
$\_\_ + \_\_ = -11$

$(v-8)(v-3)$

c) $35-12x+x^2$

$x^2-12x+35$

$\_\_ \times \_\_ = 35$
$\_\_ + \_\_ = -12$

$(x-7)(x-5)$

d) c^2-2c-8

$\_\_ \times \_\_ = -8$
$\_\_ + \_\_ = -2$

$(c-4)(c+2)$

e) $s^2-34s+33$

$\_\_ \times \_\_ = 33$
$\_\_ + \_\_ = -34$

$(s-1)(s-33)$

f) $\frac{-4b^2}{-4}-\frac{16b}{-4}+\frac{128}{-4}$ GCF!

$-4(b^2+4b-32)$

$\_\_ \times \_\_ = -32$
$\_\_ + \_\_ = 4$

$-4(b+8)(b-4)$

3. Factor each trinomial.

a) $3x^2+5x-2$

$(3)(-2) = -6$

$\_\_ \times \_\_ = -6$

$\_\_ + \_\_ = 5$

$3x^2+6x-1x-2$

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

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

b) $6m^2-7m-10$

$(6)(-10) = -60$

$\_\_ \times \_\_ = -60$

$\_\_ + \_\_ = -7$

$6m^2-12m+5m-10$

$6m(m-2)+5(m-2)$

$(m-2)(6m+5)$

c) $\frac{6x^2}{3}-\frac{21x}{3}+\frac{9}{3}$ GCF!

$3(2x^2-7x+3)$

$(2)(3) = 6$

$\_\_ \times \_\_ = 6$

$\_\_ + \_\_ = -7$

$3(2x^2-6x-1x+3)$

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

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

d) $\frac{24y^2}{2}-\frac{2y}{2}-\frac{70}{2}$ GCF!

$2(12y^2-y-35)$

$(12)(-35) = -420$

$\_\_ \times \_\_ = -420$

$\_\_ + \_\_ = -1$

$2(12y^2-21y+20y-35)$

$2(3y(4y-7)+5(4y-7))$

$2(4y-7)(3y+5)$

4. Identify whether the following polynomial is a perfect square trinomial, the difference of squares or neither. Justify your answer.

$25x^4-26y^2$

Neither.

$25x^4$ = perfect square

$26y^2$ = not perfect square

5. Factor each polynomial.

a) x^2-64 diff. of squares

$(x-8)(x+8)$

b) $121x^2-100y^2$

$(11x-10y)(11x+10y)$

c) $\frac{5w^4}{5} - \frac{80}{5}$ GCF

$5(w^4-16)$ diff. of squares.

diff of squares again! $5(w^2-4)(w^2+4)$

$5(w-2)(w+2)(w^2+4)$

d) $9a^2+48a+64$ perfect square trinomial

$(3a+8)^2$

e) $16r^2+8rt+t^2$ perfect square trinomial

$(4r+t)^2$

f) $\frac{75a^2}{3} - \frac{90a}{3} + \frac{27}{3}$

$3(25a^2-30a+9)$ perfect square trinomial.

$3(5a-3)^2$

6. Expand and simplify each expression.

a) $(f+11)(f-6)$

$f^2-6f+11f-66$

$f^2+5f-66$

b) $(r-2)(r+9)$

$r^2+9r-2r-18$

$r^2+7r-18$

c) $(2x+5y)^2$ rewrite

$(2x+5y)(2x+5y)$

$4x^2+10xy+10xy+25y^2$

$4x^2+20xy+25y^2$

7. Expand and simplify each expression.

a) $(2c-3d^2)(4c+5d-1)$

$8c^2+10cd-2c-12cd^2-15d^3+3d^2$ } no like terms cannot simplify further.

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

multiply first

$(2x-4x^2-3+6x)-1(x-3)$

$-4x^2+8x-3-x+3$

$-4x^2+7x$

c) $(x-8)+2(x-1)(x+7)$

$(x-8)+\underbrace{(2x-2)(x+7)}_{\text{multiply}}$

$(x-8)+(2x^2+14x-2x-14)$

$x-8+2x^2+12x-14$

$2x^2+13x-22$

8. Identify and correct the error(s) in the following multiplication. Rewrite the correct response.

$(3g^2+4g-2)(-g^2-g+4)$

$=-3g^4-3g^3+12g^2-4g^3+4g^2+8g+2g^2+2g+8$ (16, −)

$=-3g^4+5g^3+6g^2+10g+8$

$-3g^4-3g^3+12g-4g^3-4g^2+16g+2g^2+2g-8$

$-3g^4-7g^3-2g^2+30g-8$