

Chapter 6 Test Review p. 439

6.1

$$1. 6x^2 - 15x \\ 3x(2x - 5)$$

$$\boxed{2x - 5}$$

$$2. 2x^3y + 6x^2y^2 + 8xy^3 = \\ 2xy(x^2 + 3xy + 4y^2)$$

$$\boxed{x^2 + 3xy + 4y^2}$$

$$3. 20x^2 + 12x \\ 4 \cdot 5 \cdot x + 4 \cdot 3x \\ 4x(5x + 3)$$

$$4. 6x^2y^2 - 3xy^3 \\ 2 \cdot 3xxyy - 3xyyy \\ 3xy^2(2x - y)$$

$$5. (3x)(2x+3)(-5)(2x+3) \quad 6. (5x)(x+1)(-1)(x+1)$$

$$\boxed{(3x-5)(2x+3)}$$

$$\boxed{(5x-1)(x+1)}$$

$$7. (3x^2 - 3x) + (2x - 2) \\ (3x)(x-1) + 2(x-1) \\ (3x+2)(x-1)$$

$$8. (3a^2 + 9ab) + (3b^2 + ab) \\ (3a)(a+3b) + b(3b+a) \\ (3a+b)(a+3b)$$

$$9. (10a^2 + 5ab) + (7b^2 + 14ab) \\ (5a)(2a+b) + 7b(b+2a) \\ (5a+7b)(2a+b)$$

$$10. (6x^2 + 10x)(-3x - 5) \\ (2x)(3x+5)(-1)(3x+5) \\ (2x-1)(3x+5)$$

(b.2)

11. $x^2 + 6x + 8$
 $(x+4)(x+2)$

12. $x^2 - 11x + 24$
 $(x-8)(x-3)$

13. $x^2 + x + 2$
prime

14. $x^2 - x + 2$
prime

15. $x^2 + 4xy - 12y^2$
 $(x+6y)(x-2y)$

16. $x^2 + 8xy + 15y^2$
 $(x+3y)(x+5y)$

17. $72 - 18x - 2x^2$
 $-2(x^2 + 9x - 36)$
 $-2(x+12)(x-3)$

18. $32 + 12x - 4x^2$
 $-4(x^2 - 3x - 8)$
 $+4(x-1)$

19. $10a^3 - 110a^2 + 100a$
 $10a(a^2 - 11a + 10)$
 $10a(a-10)(a-1)$

20. $5y^3 - 50y^2 + 120y$
 $5y(y^2 - 10y + 24)$
 $5y(y-6)(y-4)$

21. -48, 2

22. GCF 3

~~a.c
2.6
12 1
13
b~~

(b.3) OR (b.4)

23. $2x^2 + 13x + 6$
 $(2x^2 + 12x) + (x + 6)$
 $2x(x+6) + 1(x+6)$
 $(2x+1)(x+6)$

24. $4x^2 + 4x - 3$
 $(4x^2 + 6x) - (2x + 3)$
 $2x(2x+3) - 1(2x+3)$
 $(2x-1)(2x+3)$

~~a.c
4. -3
-12
+6 -2
4
b~~

~~a.c
6. -4
24
+8 -3
5
b~~

25. $6x^2 + 5xy - 4y^2$
 $(6x^2 + 8xy) - (3xy - 4y^2)$
 $2x(3x+4y) - y(3x+4y)$
 $(2x-y)(3x+4y)$

26. $18x^2 - 9xy - 20y^2$
 $(18x^2 + 15xy) - (24xy - 20y^2)$
 $3x(6x+5y) - 4y(6x+5y)$
 $(3x-4y)(6x+5y)$

~~a.c
18. -20
-360
24 15
-9
b~~

~~$$\begin{array}{r} a \cdot c \\ 2 \cdot -12 \\ -24 \\ +8 \quad -3 \\ \hline 5 \\ b \end{array}$$~~

$$27. 10y^3 + 25y^2 - 60y$$

$$5y(2y^2 + 5y - 12)$$

$$5y(2y^2 + 8y - 3y - 12)$$

$$5y[2y(y+4) - 3(y+4)]$$

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

$$28. 60y^3 - 39y^2 + 6y$$

$$3y(20y^2 - 13y + 2)$$

$$3y(20y^2 - 5y - 8y + 2)$$

$$3y[5y(4y-1) - 2(4y-1)]$$

$$3y(5y-2)(4y-1)$$

~~$$\begin{array}{r} a \cdot c \\ 20 \cdot 2 \\ 40 \\ -8 \quad -5 \\ \hline -13 \\ b \end{array}$$~~

~~$$\begin{array}{r} a \cdot c \\ 9 \cdot 25 \\ 225 \\ -15 \quad -15 \\ \hline -30 \\ b \end{array}$$~~

$$29. 18x^2 - 60x + 50$$

$$2(9x^2 - 30x + 25)$$

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

$$2(3x-5)^2$$

$$30. 4x^2 - 28xy + 49y^2$$

$$(2x-7y)(2x-7y)$$

$$(2x-7y)^2$$

~~$$\begin{array}{r} a \cdot c \\ 4 \cdot 49 \\ 196 \\ -14 \quad -14 \\ \hline -28 \\ b \end{array}$$~~

(6.5)

$$31. 4x^2 - 9$$

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

$$32. 9t^2 - 25s^2$$

$$(3t+5)(3t-5)$$

$$33. 16x^2 + y^2$$

$$\text{prime}$$

SOAP
a=x
b=2y

$$34. x^3 - 8y^3$$

$$(x-2y)(x^2 + 2xy + 4y^2)$$

$$35. 8x^3 + 27$$

$$(2x+3)(4x^2 - 6x + 9)$$

SOAP
a=2x
b=3

$$36. 2x^3 + 8x$$

$$2x(x^2 + 4)$$

$$37. 54 - 2x^3y^3$$

$$2(27 - x^3y^3)$$

$$2(3-xy)(9 + 3xy + x^2y^2)$$

SOAP
a=3 b=xy

a=3x
b=2y

$$38. 9x^2 - 4y^2$$

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

$$39. 16x^4 - 1$$

$$a=4x^2 \quad b=1$$

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

$$a=2x \quad b=1$$

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

$$40. x^4 + 16$$

$$\text{prime}$$

(10.6)

$$41. (x+6)(x-2) = 0$$

$$x+6=0$$

$$\boxed{x = -6}$$

$$x-2=0$$

$$\boxed{x = 2}$$

$$42. 3x(x+1)(7x-2) = 0$$

$$3x=0$$

$$\boxed{x = 0}$$

$$x+1=0$$

$$\boxed{x = -1}$$

$$7x-2=0$$

$$7x=2$$

$$\boxed{x = \frac{2}{7}}$$

$$43. 4(5x+1)(x+3) = 0$$

$$5x+1=0$$

$$5x = -1$$

$$\boxed{x = -\frac{1}{5}}$$

$$x+3=0$$

$$\boxed{x = -3}$$

$$44. x^2 + 8x + 7 = 0$$

$$(x+7)(x+1) = 0$$

$$x+7=0$$

$$\boxed{x = -7}$$

$$x+1=0$$

$$\boxed{x = -1}$$

$$45. x^2 - 2x - 24 = 0$$

$$(x-6)(x+4) = 0$$

$$x-6=0$$

$$\boxed{x = 6}$$

$$x+4=0$$

$$\boxed{x = -4}$$

$$46. x^2 + 10x = -25$$

$$x^2 + 10x + 25 = 0$$

$$(x+5)(x+5) = 0$$

$$x+5=0$$

$$\boxed{x = -5}$$

$$x+5=0$$

$$\boxed{x = -5}$$

$$47. \widehat{x(x-10)} = -16$$

$$x^2 - 10x + 16 = 0$$

$$(x-8)(x-2) = 0$$

$$x-8=0$$

$$\boxed{x = 8}$$

$$x-2=0$$

$$\boxed{x = 2}$$

$$48. (3x-1)(9x^2 - 6x + 1) = 0$$

$$3x-1=0$$

$$3x=1$$

$$\boxed{x = \frac{1}{3}}$$

$$9x^2 - 6x + 1 = 0$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(9)(1)}}{2(9)}$$

$$= \frac{6 \pm \sqrt{0}}{18} = \frac{6}{18} = \frac{1}{3}$$

~~$$\begin{array}{r} a \cdot c \\ 56 \cdot -6 \\ -336 \\ -21 \quad +16 \\ -5 \\ b \end{array}$$~~

49. $56x^2 - 5x - 6 = 0$
 $(56x^2 - 21x) + (16x - 6) = 0$
 $(7x)(8x - 3) + 2(8x - 3) = 0$
 $(7x + 2)(8x - 3) = 0$
 $(7x + 2) = 0 \quad 8x - 3 = 0$
 $7x = -2 \quad 8x = 3$
 $x = -\frac{2}{7} \quad x = \frac{3}{8}$

50. $20x^2 - 7x - 6 = 0$
 $(20x^2 - 15x) + (8x - 6) = 0$
 $(5x)(4x - 3) + 2(4x - 3) = 0$
 $(5x + 2)(4x - 3) = 0$
 $5x + 2 = 0 \quad 4x - 3 = 0$
 $5x = -2 \quad 4x = 3$
 $x = -\frac{2}{5} \quad x = \frac{3}{4}$

~~$$\begin{array}{r} a \cdot c \\ 20 \cdot -6 \\ -120 \\ -15 \quad +8 \\ -7 \\ b \end{array}$$~~

51. $5(3x + 2) = 4$
 $15x + 10 = 4$
 $15x + 6 = 0$
 $3(5x + 2) = 0$
 $5x + 2 = 0$
 $5x = -2$
 $x = -\frac{2}{5}$

52. $6x^2 - 3x + 8 = 0$
 $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(6)(8)}}{2(6)}$
 $= \frac{3 \pm \sqrt{-183}}{12}$
non-real solutions

~~$$\begin{array}{r} a \cdot c \\ 6 \cdot 8 \\ 48 \\ -3 \\ b \end{array}$$~~

53. $\frac{12}{-12} - 5t = -\frac{3}{-12}$
 $-5t = -15$
 $t = 3$

54. $5x^3 + 20x^2 + 20x = 0$
 $5x(x^2 + 4x + 4) = 0$
 $5x(x + 2)(x + 2) = 0$
 $5x = 0 \quad x + 2 = 0 \quad x + 2 = 0$
 $x = 0 \quad x = -2 \quad x = -2$

~~$$\begin{array}{r} a \cdot c \\ 4 \cdot 21 \\ -84 \\ -12 \quad +7 \\ -5 \\ b \end{array}$$~~

55. $4t^3 - 5t^2 - 21t = 0$
 $t(4t^2 - 5t - 21) = 0$
 $t(4t^2 - 12t) + (7t - 21) = 0$
 $t[4t(t - 3) + 7(t - 3)] = 0$
 $t(4t + 7)(t - 3) = 0$
 $t - 3 = 0 \quad t = 0 \quad 4t + 7 = 0$
 $t = 3 \quad t = 0 \quad 4t = -7$
 $t = -\frac{7}{4}$

56. $x=4$ $x=5$
 $-4 -4$ $-5 -5$

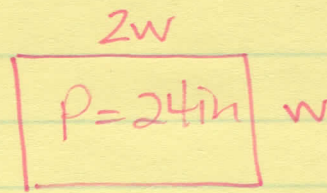
$x-4=0$ $x-5=0$

$(x-4)(x-5)=0$

OR $x^2-9x+20=0$

(6.7)

57.



C

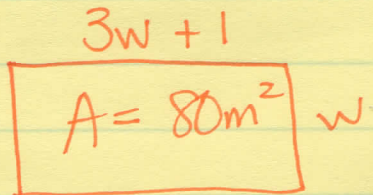
$w+w+l+l=p$

$w+w+2w+2w=24$

$6w=24$

$w=4$ $l=8$

58.



D

$A=lw$

$80=w(3w+1)$

$80=3w^2+w$

$0=3w^2+w-80$

$0=(3w^2-15w)+(16w-80)$

$0=3w(w-5)+16(w-5)$

$0=(3w+16)(w-5)$

$3w+16=0$

$w-5=0$

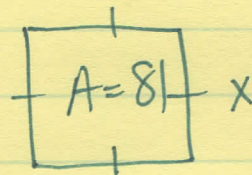
$3w=-16$

$w=5$

$w \neq \frac{-16}{3}$

$3(5)+1$
 $15+1=16$

59.

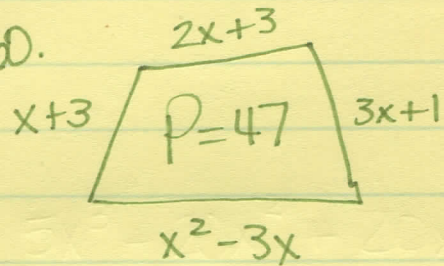


$A=81$
 $A=l^2$

$\sqrt{81}=\sqrt{l^2}$
 $\pm 9=l$

$x=9u$

60.



$47=(x+3)+(2x+3)+(3x+1)(x^2-3x)$

$47=x^2+3x+7$

$0=x^2+3x-40$

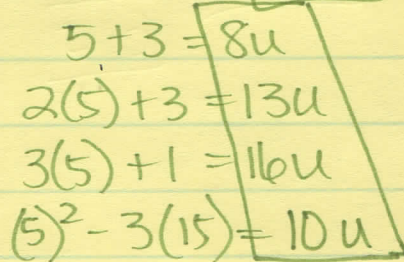
$0=(x+8)(x-5)$

$(x+8)=0$

$(x-5)=0$

$x \neq -8$

$x=5$



~~a.c
3 -80
-240
-15 +16
1
b~~

61.

$$2(20) - 15 \quad 25 \text{ in}$$

$$2w - 15$$

$$A = 500 \text{ in}^2 \quad w \quad 20 \text{ in}$$

$$A = lw$$

$$500 = (2w - 15)(w)$$

$$0 = 2w^2 - 15w - 500$$

$$0 = (2w^2 - 40w) + (25w - 500)$$

$$0 = 2w(w - 20) + 25(w - 20)$$

$$0 = (2w + 25)(w - 20)$$

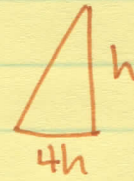
$$2w + 25 = 0 \quad w - 20 = 0$$

$$2w = -25 \quad w = 20$$

$$w \neq -\frac{25}{2}$$

$$20 \text{ in} \times 25 \text{ in}$$

62.



$$A = 162 \text{ yd}^2$$

$$A = \frac{1}{2}bh$$

$$162 = \frac{1}{2}(4h)(h)$$

$$162 = 2h^2$$

$$\sqrt{81} = \sqrt{h^2}$$

$$\pm 9 = h$$

$$h = 9 \text{ yd} \quad b = 36 \text{ yd}$$

63. $x(x+1) = 380$

$$x^2 + x - 380 = 0$$

$$(x+20)(x-19) = 0$$

$$x+20=0 \quad x-19=0$$

$$x \neq -20 \quad x = 19$$

$$19, 20$$

64. $x(x+2) = 440$

$$x^2 + 2x - 440 = 0$$

$$(x-20)(x+22) = 0$$

$$x-20=0 \quad x+22=0$$

$$x=20 \quad x \neq -22$$

$$20, 22$$

65. $h = -16t^2 + 440t$

(a) $y_1 = h$

$$y_2 = 2800$$

$$(10, 2800) \quad (17.5, 2800)$$

$$x = 10 \text{ secs}, \quad \frac{1}{2} 17.5 \text{ secs}$$

Going up & coming back down.

(b) $h = -16t^2 + 440t$

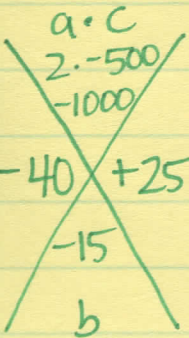
$$0 = -16t(t - 27.5)$$

$$-16t = 0 \quad t - 27.5 = 0$$

$$t = 0$$

$$t = 27.5$$

$$x = 27.5 \text{ secs}$$



Mixed Review

$$67. \frac{7x - 63}{7(x-9)}$$

$$68. \frac{11x(4x-3) - 6(4x-3)}{(11x-6)(4x-3)}$$

$$69. m^2 - \frac{4}{25}$$

$a=m$ $b=\frac{2}{5}$

$$\left(m + \frac{2}{5}\right)\left(m - \frac{2}{5}\right)$$

$$70. (3x^3 - 4x^2) + (6x - 8)$$
$$x^2(3x-4) + 2(3x-4)$$
$$(x^2+2)(3x-4)$$

$$71. (xy + 2x)(-y - 2)$$
$$x(y+2) - 1(y+2)$$
$$(x-1)(y+2)$$

$$72. 2x^2 + 2x - 24$$
$$2(x^2 + x - 12)$$
$$2(x+4)(x-3)$$

$$73. 3x^3 - 30x^2 + 27x$$
$$3x(x^2 - 10x + 9)$$
$$3x(x-9)(x-1)$$

$$74. 4x^2 - 81$$

$a=2x$ $b=9$

$$(2x+9)(2x-9)$$

$$75. 2x^2 - 18$$
$$2(x^2 - 9)$$

$a=x$ $b=3$

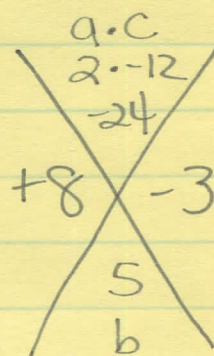
$$2(x+3)(x-3)$$

$$76. 16x^2 - 24x + 9$$
$$(4x-3)(4x-3)$$
$$(4x-3)^2$$

pattern

$$77. 5x^2 + 20x + 20$$
$$5(x^2 + 4x + 4)$$
$$5(x+2)(x+2) \text{ OR}$$
$$5(x+2)^2$$

$$78. 2x^2 + 5x - 12$$
$$(2x^2 + 8x)(-3x - 12)$$
$$2x(x+4) - 3(x+4)$$
$$(2x-3)(x+4)$$



79. $4x^2y - 6xy^2$
 $2xy(2x - 3y)$

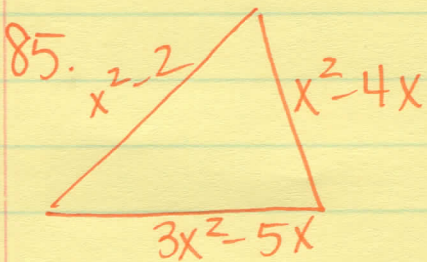
80. $125x^3 + 27$ SOAP
 $a = 5x \quad b = 3$
 $(5x+3)(25x^2 - 15x + 9)$

81. $24x^2 - 3x - 18$
 $3(8x^2 - x - 6)$

82. $(x+7)^2 - y^2$ $a = (x+7)$
 $(x+7+y)(x+7-y)$ $b = y$

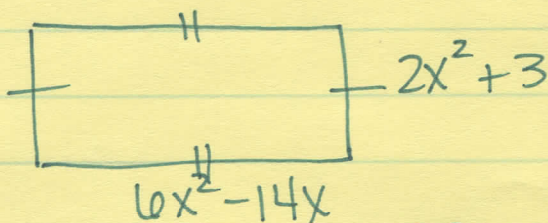
83. $x^2(x+3) - 4(x+3)$
 $(x^2-4)(x+3)$
 $(x+2)(x-2)(x+3)$

84. $54a^3b - 2b$
 $2b(27a^3 - 1)$ SOAP
 $a = 3a \quad b = 1$
 $2b(3a-1)(9a^2 + 3a + 1)$



$P = (x^2-2) + (x^2-4x) + (3x^2-5x)$
 $= 5x^2 - 9x - 2$
 $(5x^2 - 10x) + (x - 2)$
 $5x(x-2) + 1(x-2)$
 $(5x+1)(x-2)$

86.



$P = (2x^2+3) + (2x^2+3) + (6x^2-14x) + (6x^2-14x)$

$= 2(2x^2+3) + 2(6x^2-14x)$
 $= 4x^2 + 6 + 12x^2 - 28x$
 $= 16x^2 - 28x + 6$
 $= 2(8x^2 - 14x + 3)$
 $= 2(8x^2 - 2x)(12x + 3)$
 $= 2[2x(4x-1) - 3(4x-1)]$
 $= 2(4x-1)(2x-3)$

~~$a \cdot c$
 $8 \cdot 3$
 24
 $-2 \quad -12$
 b~~

~~$a \cdot c$
 $5 \cdot -2$
 -10
 $-10 \quad +1$
 b~~

~~$a \cdot c$
 $8 \cdot -6$
 -48
 $X \quad X$
 -1
 b~~

~~$$\begin{array}{r} a \cdot c \\ 2 \cdot -28 \\ -8 \cdot +7 \\ -1 \\ b \end{array}$$~~

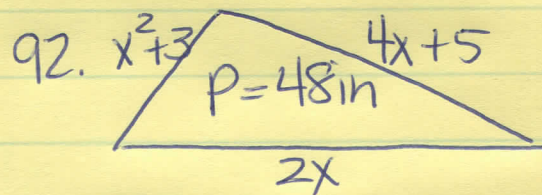
87. $2x^2 - x - 28 = 0$
 $(2x^2 - 8x) + (7x - 28) = 0$
 $2x(x-4) + 7(x-4) = 0$
 $(2x+7)(x-4) = 0$
 $2x+7=0 \quad x-4=0$
 $2x = -7 \quad x = 4$
 $x = -\frac{7}{2} \quad x = 4$

88. $x^2 - 2x = 15$
 $x^2 - 2x - 15 = 0$
 $(x-5)(x+3) = 0$
 $x-5=0 \quad x+3=0$
 $x = 5 \quad x = -3$

89. $2x(x+7)(x+4) = 0$
 $2x=0 \quad x+7=0 \quad x+4=0$
 $x=0 \quad x=-7 \quad x=-4$

90. $x(x-5) = -6$
 $x^2 - 5x + 6 = 0$
 $(x-6)(x+1) = 0$
 $x-6=0 \quad x+1=0$
 $x=6 \quad x=-1$

91. $x^2 = 16x$
 $x^2 - 16x = 0$
 $x(x-16) = 0$
 $x=0 \quad x-16=0$
 $x=16$



$48 = (x^2+3) + (4x+5) + (2x)$
 $48 = x^2 + 6x + 8$
 $0 = x^2 + 6x - 40$
 $0 = (x+10)(x-4)$
 $x+10=0 \quad x-4=0$
 $x \neq -10 \quad x=4$

$4(4) + 5 = 21 \text{ in}$
 $(4)^2 + 3 = 19 \text{ in}$
 $2(4) = 8 \text{ in}$

93.

lin

$$A = 12 \text{ in}^2 \quad l - 4 \text{ in}$$

$$A = lw$$

$$12 = l(l - 4)$$

$$12 = l^2 - 4l$$

$$0 = l^2 - 4l - 12$$

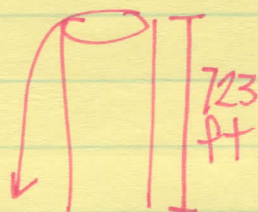
$$0 = (l - 6)(l + 2)$$

$$l - 6 = 0 \quad l + 2 = 0$$

$$l = 6 \text{ in} \quad l \neq -2$$

$$6 \text{ in} \times 2 \text{ in}$$

94.



$$h = -16t^2 + 729$$

$$h = (-4t + 27)(4t + 27)$$

$$0 = (-4t + 27)(4t + 27)$$

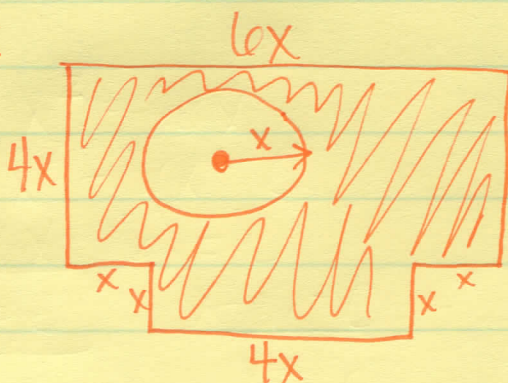
$$-4t + 27 = 0 \quad 4t + 27 = 0$$

$$-4t = -27$$

$$t = \frac{27}{4} \approx 6.75 \text{ secs}$$

$$t \neq -\frac{27}{4} \text{ no - secs}$$

95.



$$A = (\text{rectangle} - \text{circle}) + \text{square}$$

$$= [(6x \cdot 4x) - \pi(x)^2] + x(4x)$$

$$= 24x^2 - x^2\pi + 4x^2$$

$$= [28x^2 - \pi x^2] u^2$$

$$= x^2(28 - \pi) u^2$$