Lesson Practice 12A

1. $X = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(2)}}{2(1)} = \frac{-6 \pm \sqrt{28}}{2} = \frac{-6 \pm 2\sqrt{7}}{2} = -3 \pm \sqrt{7}$

2. $X^2 - 5X + 4 = 0$

$(X - 4)(X - 1) = 0$

$X - 4 = 0 \qquad X - 1 = 0$

$X = 4 \qquad X = 1$

3. $X = \frac{-(7) \pm \sqrt{(7)^2 - 4(3)(-1)}}{2(3)} = \frac{-7 \pm \sqrt{61}}{6}$

4. $A^2 - 10A - 11 = 0$

$(A - 11)(A + 1) = 0$

$A - 11 = 0 \qquad A + 1 = 0$

$A = 11 \qquad A = -1$

5. $2Q^2 + 2 = 17Q$

$2Q^2 - 17Q + 2 = 0$

$\frac{-(-17) \pm \sqrt{(-17)^2 - 4(2)(2)}}{2(2)} = \frac{17 \pm \sqrt{273}}{4}$

6. $5X^2 + 15X + 10 = 0$

$(5)(X + 1)(X + 2) = 0$

$X + 1 = 0 \qquad X + 2 = 0$

$X = -1 \qquad X = -2$

7. $\frac{1}{4}R^2 - \frac{1}{2}R + \frac{3}{2} = 0$

$(4)\frac{1}{4}R^2 - (4)\frac{1}{2}R + (4)\frac{3}{2} = (4)0$

$R^2 - 2R + 6 = 0$

$\frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(6)}}{2(1)} = \frac{2 \pm \sqrt{-20}}{2} = \frac{2 \pm 2i\sqrt{5}}{2} = 1 \pm i\sqrt{5}$

8. $16X^2 = 2X + 4$

$8X^2 = X + 2$

$8X^2 - X - 2 = 0$

$X = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(8)(-2)}}{2(8)} = \frac{1 \pm \sqrt{65}}{16}$

9. $X = \frac{-(3) \pm \sqrt{(3)^2 - 4(2)(-8)}}{2(2)} = \frac{-3 \pm \sqrt{73}}{4}$

10. $Y^2 = \frac{3}{4}Y + 2$

$(4)Y^2 = (4)\frac{3}{4}Y + (4)2$

$4Y^2 = 3Y + 8$

$4Y^2 - 3Y - 8 = 0$

$X = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(4)(-8)}}{2(4)} = \frac{3 \pm \sqrt{137}}{8}$

Lesson Practice 12B

1. $X = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(8)(-3)}}{2(8)} = \frac{1 \pm \sqrt{97}}{16}$

2. $7 = 2X^2 + X$

$0 = 2X^2 + X - 7$

$X = \frac{-(1) \pm \sqrt{(1)^2 - 4(2)(-7)}}{2(2)} = \frac{-1 \pm \sqrt{57}}{4}$

3. $Q = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(3)}}{2(1)} = \frac{6 \pm \sqrt{24}}{2} = \frac{6 \pm 2\sqrt{6}}{2} = 3 \pm \sqrt{6}$

4. $2 + 3X + 4X^2 = 0$

$4X^2 + 3X + 2 = 0$

$X = \frac{-(3) \pm \sqrt{(3)^2 - 4(4)(2)}}{2(4)} = \frac{-3 \pm \sqrt{-23}}{8} = \frac{-3 \pm i\sqrt{23}}{8}$

5. $P = P^2 - 2$

$0 = P^2 - P - 2$

$0 = (P - 2)(P + 1)$

$P - 2 = 0 \qquad P + 1 = 0$

$P = 2 \qquad P = -1$

6. $X^2 + \frac{1}{5}X + 5 = 0$

$(5)X^2 + (5)\frac{1}{5}X + (5)5 = (5)0$

$5X^2 + X + 25 = 0$

$X = \frac{-(1) \pm \sqrt{(1)^2 - 4(5)(25)}}{2(5)} = \frac{-1 \pm i\sqrt{499}}{10}$

7. $20X^2 + 40X = 30$

$2X^2 + 4X = 3$

$2X^2 + 4X - 3 = 0$

$X = \frac{-(4) \pm \sqrt{(4)^2 - 4(2)(-3)}}{2(2)} = \frac{-4 \pm \sqrt{40}}{4} =$

$\frac{-4 \pm 2\sqrt{10}}{4} = \frac{-2 \pm \sqrt{10}}{2}$

8. $X = \frac{-(2) \pm \sqrt{(2)^2 - 4(5)(-1)}}{2(5)} = \frac{-2 \pm \sqrt{24}}{10} =$

$\frac{-2 \pm 2\sqrt{6}}{10} = \frac{-1 \pm \sqrt{6}}{5}$

9. $3X^2 = -5X$

$3X^2 + 5X = 0$

$(X)(3X + 5) = 0$

$X = 0 \qquad 3X + 5 = 0$

$3X = -5$

$X = -\frac{5}{3}$

10. $\frac{-(B) \pm \sqrt{(B)^2 - 4(A)(C)}}{2(A)} = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$

3. $X^2 - 3X + 1 = -6X$

$X^2 + 3X + 1 = 0$

$X = \frac{-(3) \pm \sqrt{(3)^2 - 4(1)(1)}}{2(1)} = \frac{-3 \pm \sqrt{5}}{2}$

4. $X^2 + 4X - 12 = 0$

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

$X + 6 = 0 \qquad X - 2 = 0$

$X = -6 \qquad X = 2$

5. $X = \frac{-(2) \pm \sqrt{(2)^2 - 4(2)(5)}}{2(2)} =$

$\frac{-2 \pm \sqrt{-36}}{4} = \frac{-2 \pm 6i}{4} = \frac{-1 \pm 3i}{2}$

6. $X^2 + 8X = -16$

$X^2 + 8X + 16 = 0$

$(X + 4)(X + 4) = 0$

$X + 4 = 0 \qquad X = -4$

7. 169

8. $2X^2 + 9X + ___$

divide through by 2:

$X^2 + \frac{9}{2}X + ___$

complete the square:

$X^2 + \frac{9}{2}X + \frac{81}{16}$

multiply through by 2:

$2X^2 + 9X + \frac{81}{8}$

9. $40X$

10. $2\sqrt{14}X$

Systematic Review 12C

1. $X^2 - 5X + 6 = 0$

$(X - 3)(X - 2) = 0$

$X - 3 = 0 \qquad X - 2 = 0$

$X = 3 \qquad X = 2$

2. $X = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(2)}}{2(1)} =$

$\frac{-4 \pm 2\sqrt{2}}{2} = -2 \pm \sqrt{2}$

11. $x^2 + \frac{1}{3}x - \frac{4}{3} = 0$

$x^2 + \frac{1}{3}x + \frac{1}{36} = \frac{4}{3} + \frac{1}{36}$

$\left(x + \frac{1}{6}\right)^2 = \frac{4(12)}{3(12)} + \frac{1}{36}$

$\left(x + \frac{1}{6}\right)^2 = \frac{49}{36}$

$x + \frac{1}{6} = \sqrt{\frac{49}{36}}$

$x = -\frac{1}{6} \pm \frac{7}{6}$

$x = -\frac{1}{6} + \frac{7}{6}$ $\qquad$ $x = -\frac{1}{6} - \frac{7}{6}$

$x = \frac{6}{6} = 1$ $\qquad$ $x = -\frac{8}{6} = -\frac{4}{3}$

12. $(1)^2 + \frac{1}{3}(1) - \frac{4}{3} = 0$

$1 + \frac{1}{3} - \frac{4}{3} = 0$

$\frac{3}{3} + \frac{1}{3} - \frac{4}{3} = 0$

$0 = 0$

$\left(-\frac{4}{3}\right)^2 + \frac{1}{3}\left(-\frac{4}{3}\right) - \frac{4}{3} = 0$

$\frac{16}{9} - \frac{4}{9} - \frac{12}{9} = 0$

$0 = 0$

13. $(x - a)^6 = 1x^6(-a)^0 + 6x^5(-a)^1 +$
$15x^4(-a)^2 + 20x^3(-a)^3 + 15x^2(-a)^4 +$
$6x^1(-a)^5 + 1x^0(-a)^6 =$
$x^6 - 6x^5a + 15x^4a^2 - 20x^3a^3 +$
$15x^2a^4 - 6xa^5 + a^6$

14. $\frac{4}{1}\left(\frac{1}{2}x\right)^3(-3a)^1 = 4\left(\frac{1}{8}\right)x^3(-3a) = -\frac{3}{2}x^3a$

15. $(5 - 2a)^3 =$
$1(5)^3(-2a)^0 + 3(5)^2(-2a)^1 +$
$3(5)^1(-2a)^2 + 1(5)^0(-2a)^3 =$
$125 - 150a + 60a^2 - 8a^3$

16. $(x - 2y)$

17. $\frac{6 + 5i}{3i - 2} = \frac{(6 + 5i)(3i + 2)}{(3i - 2)(3i + 2)} =$
$\frac{18i + 12 + 15i^2 + 10i}{9i^2 - 4} = \frac{28i + 12 + 15(-1)}{9(-1) - 4} =$
$\frac{28i + 12 - 15}{-9 - 4} = \frac{28i - 3}{-13}$

18. $\frac{2 + \sqrt{-49}}{2 - \sqrt{-49}} = \frac{\left(2 + \sqrt{-49}\right)\left(2 + \sqrt{-49}\right)}{\left(2 - \sqrt{-49}\right)\left(2 + \sqrt{-49}\right)} =$
$\frac{4 + 4\sqrt{-49} - 49}{4 - (-49)} = \frac{-45 + 4i(7)}{4 + 49} = \frac{-45 + 28i}{53}$

19. $\frac{2}{3 - \sqrt{7}} = \frac{2\left(3 + \sqrt{7}\right)}{\left(3 - \sqrt{7}\right)\left(3 + \sqrt{7}\right)} =$
$\frac{6 + 2\sqrt{7}}{9 - 7} = \frac{6 + 2\sqrt{7}}{2} = \frac{3 + \sqrt{7}}{1} = 3 + \sqrt{7}$

20. $\frac{2 + \sqrt{5}}{2\sqrt{5} - 4} = \frac{\left(2 + \sqrt{5}\right)\left(2\sqrt{5} + 4\right)}{\left(2\sqrt{5} - 4\right)\left(2\sqrt{5} + 4\right)} =$
$\frac{4\sqrt{5} + 8 + 4\sqrt{5} + 2\sqrt{25}}{4(5) - 16} = \frac{8\sqrt{5} + 8 + 2(5)}{20 - 16} =$
$\frac{8\sqrt{5} + 8 + 10}{4} = \frac{8\sqrt{5} + 18}{4} = \frac{4\sqrt{5} + 9}{2}$

Systematic Review 12D

1. $x = \frac{-(-9) \pm \sqrt{(-9)^2 - 4(2)(-7)}}{2(2)} = \frac{9 \pm \sqrt{137}}{4}$

2. $x = \frac{-(5) \pm \sqrt{(5)^2 - 4(1)(-2)}}{2(1)} = \frac{-5 \pm \sqrt{33}}{2}$

3. $3x^2 + 7x + 4 = 0$
$(3x + 4)(x + 1) = 0$

$3x + 4 = 0$ $\qquad$ $x + 1 = 0$

$3x = -4$ $\qquad$ $x = -1$

$x = -\frac{4}{3}$

4. $x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(12)}}{2(1)} =$
$\frac{6 \pm \sqrt{-12}}{2} = \frac{6 \pm 2i\sqrt{3}}{2} = 3 \pm i\sqrt{3}$

5. $5X^2 - 3X - 2 = 0$

$(5X + 2)(X - 1) = 0$

$5X + 2 = 0 \qquad X - 1 = 0$

$5X = -2 \qquad X = 1$

$X = -\frac{2}{5}$

6. $4X^2 + 1 = 4X$

$4X^2 - 4X + 1 = 0$

$(2X - 1)(2X - 1) = 0$

$2X - 1 = 0$

$2X = 1$

$X = \frac{1}{2}$

7. $\frac{25}{4}$

8. $\frac{1}{16}$

9. $25X^2 + ___ + 1$

divide through by 25:

$X^2 + ___ + \frac{1}{25}$

complete the square:

$X^2 + \underline{\frac{2}{5}X} + \frac{1}{25}$

multiply through by 25:

$25X^2 + \underline{10X} + 1$

10. $49X^2 - ___ + 4$

divide through by 49:

$X^2 - ___ + \frac{4}{49}$

complete the square:

$X^2 - \underline{\frac{4}{7}X} + \frac{4}{49}$

multiply through by 49:

$49X^2 - \underline{28X} + 4$

11. $X^2 - 12X + 20 = 0$

$(X - 10)(X - 2) = 0$

$X - 10 = 0 \qquad X - 2 = 0$

$X = 10 \qquad X = 2$

12. $(10)^2 - 12(10) + 20 = 0$

$100 - 120 + 20 = 0$

$0 = 0$

$(2)^2 - 12(2) + 20 = 0$

$4 - 24 + 20 = 0$

$0 = 0$

13. $(X + 1)^4 =$

$1X^4 1^0 + 4X^3 1^1 + 6X^2 1^2 + 4X^1 1^3 + 1X^0 1^4 =$

$X^4 + 4X^3 + 6X^2 + 4X + 1$

14. $\frac{4 \cdot 3 \cdot 2 \cdot 1}{1 \cdot 2 \cdot 3 \cdot 4}\left(\frac{1}{2}X\right)^0(-3A)^4 = 81A^4$

15. $\left(10 - \frac{1}{X}\right)^3 = 1(10)^3\left(-\frac{1}{X}\right)^0 +$

$3(10)^2\left(-\frac{1}{X}\right)^1 + 3(10)^1\left(-\frac{1}{X}\right)^2 + 1(10)^0\left(-\frac{1}{X}\right)^3 =$

$1000 - \frac{300}{X} + \frac{30}{X^2} - \frac{1}{X^3}$

16. $(X + 2)$

17. $\frac{4 - 3i}{2i} = \frac{(4 - 3i)(i)}{2i(i)} = \frac{4i - 3i^2}{2i^2} =$

$\frac{4i - 3(-1)}{2(-1)} = \frac{4i + 3}{-2}$

18. $\frac{10 + \sqrt{-A}}{10 - \sqrt{-A}} = \frac{\left(10 + \sqrt{-A}\right)\left(10 + \sqrt{-A}\right)}{\left(10 - \sqrt{-A}\right)\left(10 + \sqrt{-A}\right)} =$

$\frac{100 + 20\sqrt{-A} - A}{100 - (-A)} = \frac{100 + 20i\sqrt{A} - A}{100 + A}$

19. $\frac{9}{7 + \sqrt{10}} = \frac{9\left(7 - \sqrt{10}\right)}{\left(7 + \sqrt{10}\right)\left(7 - \sqrt{10}\right)} =$

$\frac{63 - 9\sqrt{10}}{49 - 10} = \frac{63 - 9\sqrt{10}}{39} = \frac{21 - 3\sqrt{10}}{13}$

20. $\frac{4 - \sqrt{6}}{3\sqrt{7} + 5} = \frac{\left(4 - \sqrt{6}\right)\left(3\sqrt{7} - 5\right)}{\left(3\sqrt{7} + 5\right)\left(3\sqrt{7} - 5\right)} =$

$\frac{12\sqrt{7} - 20 - 3\sqrt{42} + 5\sqrt{6}}{9(7) - 25} =$

$\frac{12\sqrt{7} - 20 - 3\sqrt{42} + 5\sqrt{6}}{63 - 25} =$

$\frac{12\sqrt{7} - 20 - 3\sqrt{42} + 5\sqrt{6}}{38}$

Systematic Review 12E

1. $X^2 + 2X - 8 = 0$

$(X + 4)(X - 2) = 0$

$X + 4 = 0$ $\qquad$ $X - 2 = 0$

$X = -4$ $\qquad$ $X = 2$

2. $X^2 - 6X = -8$

$X^2 - 6X + 8 = 0$

$(X - 4)(X - 2) = 0$

$X - 4 = 0$ $\qquad$ $X - 2 = 0$

$X = 4$ $\qquad$ $X = 2$

3. $2X^2 - 15X + 7 = 0$

$(2X - 1)(X - 7) = 0$

$2X - 1 = 0$ $\qquad$ $X - 7 = 0$

$2X = 1$ $\qquad$ $X = 7$

$X = \frac{1}{2}$

4. $3X^2 + 4X = 7$

$3X^2 + 4X - 7 = 0$

$(3X + 7)(X - 1) = 0$

$3X + 7 = 0$ $\qquad$ $X - 1 = 0$

$3X = -7$ $\qquad$ $X = 1$

$X = -\frac{7}{3}$

5. $2 = 5X + X^2$

$0 = X^2 + 5X - 2$

$X = \frac{-(5) \pm \sqrt{(5)^2 - 4(1)(-2)}}{2(1)} = \frac{-5 \pm \sqrt{33}}{2}$

6. $X^2 + 2X - 15 = 0$

$(X + 5)(X - 3) = 0$

$X + 5 = 0$ $\qquad$ $X - 3 = 0$

$X = -5$ $\qquad$ $X = 3$

7. $4X^2 + 28X + ___$

divide through by 4:

$X^2 + 7X + ___$

complete the square:

$X^2 + 7X + \frac{49}{4}$

multiply through by 4:

$4X^2 + 28X + 49$

8. $9X^2 - 36X + ___$

divide through by 9:

$X^2 - 4X + ___$

complete the square:

$X^2 - 4X + \underline{4}$

multiply through by 9:

$9X^2 - 36X + 36$

9. $36X^2 + ___ + 25$

divide through by 36:

$X^2 + ___ + \frac{25}{36}$

complete the square:

$X^2 + \frac{10}{6}X + \frac{25}{36}$

multiply through by 36:

$36X^2 + \underline{60X} + 25$

10. $81X^2 - ___ + 121$

divide through by 81:

$X^2 - ___ + \frac{121}{81}$

complete the square:

$X^2 - \frac{22}{9}X + \frac{121}{81}$

multiply through by 81:

$81X^2 - \underline{198X} + 121$

11. $X^2 + 5X - 14 = 0$

$(X + 7)(X - 2) = 0$

$X + 7 = 0$ $\qquad$ $X - 2 = 0$

$X = -7$ $\qquad$ $X = 2$

12. $(-7)^2 + 5(-7) - 14 = 0$

$49 - 35 - 14 = 0$

$0 = 0$

$(2)^2 + 5(2) - 14 = 0$

$4 + 10 - 14 = 0$

$0 = 0$

13. $(2X + 1)^5 =$

$1(2X)^5 1^0 + 5(2X)^4 1^1 + 10(2X)^3 1^2 +$

$10(2X)^2 1^3 + 5(2X)^1 1^4 + 1(2X)^0 1^5 =$

$32X^5 + 80X^4 + 80X^3 + 40X^2 + 10X + 1$

14. $\frac{5\cdot 4}{1\cdot 2}\left(\frac{1}{3}x\right)^3(2)^2 = 10\left(\frac{1}{27}\right)x^3(4) = \frac{40}{27}x^3$

15. $\left(x-\frac{3}{5}\right)^3 = 1x^3\left(-\frac{3}{5}\right)^0 + 3x^2\left(-\frac{3}{5}\right)^1 +$

$3x^1\left(-\frac{3}{5}\right)^2 + 1x^0\left(-\frac{3}{5}\right)^3 =$

$x^3 - \frac{9}{5}x^2 + \frac{27}{25}x - \frac{27}{125}$

16. $(2x+1)$

17. $\frac{10+i}{5i} = \frac{(10+i)(i)}{5i(i)} = \frac{10i+i^2}{5i^2} = \frac{10i-1}{-5}$

18. $\frac{10}{5-\sqrt{8}} = \frac{10\left(5+\sqrt{8}\right)}{\left(5-\sqrt{8}\right)\left(5+\sqrt{8}\right)} = \frac{50+10\sqrt{8}}{25-8} =$

$\frac{50+10\sqrt{4}\sqrt{2}}{17} = \frac{50+10(2)\sqrt{2}}{17} = \frac{50+20\sqrt{2}}{17}$

19. $\frac{2+3\sqrt{6}}{1-\sqrt{6}} = \frac{\left(2+3\sqrt{6}\right)\left(1+\sqrt{6}\right)}{\left(1-\sqrt{6}\right)\left(1+\sqrt{6}\right)} =$

$\frac{2+2\sqrt{6}+3\sqrt{6}+3(6)}{1-6} = \frac{2+5\sqrt{6}+18}{-5} =$

$\frac{20+5\sqrt{6}}{-5} = \frac{4+\sqrt{6}}{-1} = -4-\sqrt{6}$

20. $\frac{6-\sqrt{2}}{10\sqrt{3}-8} = \frac{\left(6-\sqrt{2}\right)\left(10\sqrt{3}+8\right)}{\left(10\sqrt{3}-8\right)\left(10\sqrt{3}+8\right)} =$

$\frac{60\sqrt{3}+48-10\sqrt{6}-8\sqrt{2}}{100(3)-64} =$

$\frac{2\left(30\sqrt{3}+24-5\sqrt{6}-4\sqrt{2}\right)}{300-64} =$

$\frac{2\left(30\sqrt{3}+24-5\sqrt{6}-4\sqrt{2}\right)}{236} =$

$\frac{30\sqrt{3}+24-5\sqrt{6}-4\sqrt{2}}{118}$

Honours Lesson 12

1. $\binom{6}{5-1}X^{6-5+1}Y^{5-1} = \binom{6}{4}X^2Y^4$

   $\frac{6!}{2!4!}X^2Y^4 = \frac{6 \times 5 \times \cancel{4!}}{2 \times \cancel{4!}} = 15X^2Y^4$

2. $\binom{4}{2-1}A^{4-2+1}2^{2-1} = \binom{4}{1}A^32 = 8A^3$

3. $\binom{5}{3-1}P^{5-3+1}Q^{3-1} = \binom{5}{2}P^3Q^2$

   $\frac{5!}{3!2!}P^3Q^2 = \frac{5 \times 4 \times \cancel{3!}}{\cancel{3!} \times 2 \times 1} = 10P^3Q^2$

4. $\binom{7}{4-1}(2X)^{7-4+1}\left(-1^{4-1}\right) = \binom{7}{3}(2X)^4\left(-1^3\right) =$

   $\frac{7!}{4!3!}\left(-16X^4\right) = \frac{7 \times \cancel{6} \times 5 \times \cancel{4!}}{\cancel{4!} \times \cancel{3 \times 2} \times 1}\left(-16X^4\right)$

   $= (35)\left(-16X^4\right) = -560X^4$

Test 12

1. B : A, C and D are equations whose highest exponent is 2. The quadratic equation works for equations of this nature only.

2. B : $\frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$

3. C : All quadratic equations have constants A, B and C, which can be substituted into the quadratic formula. Not every quadratic equation can be factored.

4. C : Standard form provides A, B and C with the proper sign

5. A : $7X^2 + 2X - 1 = 0$
$A = 7;\ B = 2;\ C = -1$

6. A : $X^2 - 36 = 0$
$(X - 6)(X + 6) = 0$
$X - 6 = 0 \qquad X + 6 = 0$
$X = 6 \qquad X = -6$

7. D : $X^2 + 3X + 3 = 0$
$A = 1;\ B = 3;\ C = 3$
$X = \frac{-(3) \pm \sqrt{(3)^2 - 4(1)(3)}}{2(1)} =$
$\frac{-3 \pm \sqrt{9 - 12}}{2} = \frac{-3 \pm \sqrt{-3}}{2} = \frac{-3 \pm i\sqrt{3}}{2}$

8. B : $5X^2 + 2X - 1 = 0$
$A = 5;\ B = 2;\ C = -1$
$X = \frac{-(2) \pm \sqrt{(2)^2 - 4(5)(-1)}}{2(5)} =$
$\frac{-2 \pm \sqrt{4 - (-20)}}{10} = \frac{-2 \pm \sqrt{4 + 20}}{10} =$
$\frac{-2 \pm \sqrt{24}}{10} = \frac{-2 \pm \sqrt{4}\sqrt{6}}{10} =$
$\frac{-2 \pm 2\sqrt{6}}{10} = \frac{-1 \pm \sqrt{6}}{5}$

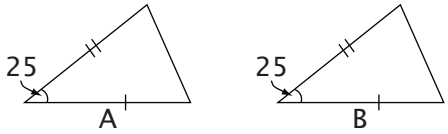
9. D : $4X^2 + 20X + 25 = 0$
$(2X + 5)(2X + 5) = 0$
$2X + 5 = 0$
$2X = -5$
$X = -\frac{5}{2}$

10. C : $4X^2 + 4X - 10 = 0$
$A = 4;\ B = 4;\ C = -10$
$X = \frac{-(4) \pm \sqrt{(4)^2 - 4(4)(-10)}}{2(4)} =$
$\frac{-4 \pm \sqrt{16 - (-160)}}{8} = \frac{-4 \pm \sqrt{16 + 160}}{8} =$
$\frac{-4 \pm \sqrt{176}}{8} = \frac{-4 \pm \sqrt{16}\sqrt{11}}{8} =$
$\frac{-4 \pm 4\sqrt{11}}{8} = \frac{-1 \pm \sqrt{11}}{2}$

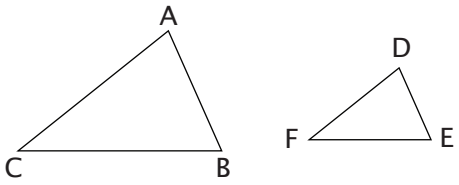
11. C : $\overline{ED}$

12. B : A rhombus and a parallelogram have 2 pairs of parallel sides. A regular polygon may have any number of sides.

13. C : SAS stands for side angle side.



14. D : Knowing that the angles of one triangle are the same as the angles of another triangle proves similarity, not congruence.



15. A : 5 m = 500 cm = 5000 mm = .005 km