Name:

Exam Style Questions

Solving Equations: Fractional (advanced)

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

Secondary

Video 111a

1. Solve

$$\frac{2}{x} + \frac{2}{x+3} = 1$$

$$\frac{2(x+3)+2x}{x(x+3)} = 1$$

$$2x+6+2x = x^2+3x$$

$$0 = x^2 - x - 6$$

$$0 = (x+2)(x-3)$$

$x=-2 \quad x=3$

(5)

2. Solve

$$\frac{7}{x} - \frac{2}{x+2} = 3$$

$$\frac{7(x+2)-2x}{x(x+2)} = 3$$

$$7x+14-2x = 3x^2+6x$$

$$0 = 3x^2+x-14$$

$$0 = (3x+7)(x-2)$$

$$x=-\frac{7}{3} \quad x=2$$

$x=-7/3 \quad x=2$

(5)

3. Solve

$$\frac{7}{x+2} + \frac{10}{2x-5} = 3$$

$$\frac{7(2x-5)+10(x+2)}{(x+2)(2x-5)} = 3$$

$$\frac{14x-35+10x+20}{2x^2+4x-10-5x} = 3$$

$$24x-15 = 6x^2-3x-30$$

$$0 = 6x^2-27x-15$$

$$0 = 2x^2-9x-5$$

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

$x=5 \quad x=-1/2$

(5)

4. Solve, giving your answers to 1 decimal place.

$$\frac{1}{2x+1} + \frac{4}{x-2} = 1$$

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

$$\frac{x-2+8x+4}{2x^2-3x-2} = 1$$

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

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

$$0 = x^2-6x-2$$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

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

$x = 6.31662$ or $x = -0.316625$

$x=-0.3$ or $x=6.3$

(6)

5. Solve, giving your answers to 1 decimal place.

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

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

$$\frac{x^2 - x + 3 + 12x}{x + 4x^2 - 4x - 1} = 2$$

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

$$x^2 + 11x + 3 = 2(4x^2 - 3x - 1)$$

$$x^2 + 11x + 3 = 8x^2 - 6x - 2$$

$$0 = 7x^2 - 17x - 5$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-17) \pm \sqrt{(-17)^2 - 4(7)(-5)}}{2(7)}$$

$x = 2.69374$ or $x = -0.265165$

$x = -0.3$ or $x = 2.7$

(6)

6. Solve, giving your answers to 1 decimal place.

$$\frac{2x-1}{x} - \frac{4}{x+2} = 5$$

$$\frac{(2x-1)(x+2) - 4x}{x(x+2)} = 5$$

$$\frac{2x^2 + 4x - x - 2 - 4x}{x^2 + 2x} = 5$$

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

$$0 = 3x^2 + 11x + 2$$

$$x = \frac{-(11) \pm \sqrt{(11)^2 - 4(3)(2)}}{2(3)}$$

$x = -0.191857$

or $x = -3.47481$

$x = -0.2$

$x = -3.5$

(6)

7. Solve, giving your answers to 1 decimal places.

$$\frac{x-4}{x+5} - \frac{3x-2}{x+1} = 1$$

$$\frac{(x-4)(x+1) - (3x-2)(x+5)}{(x+5)(x+1)} = 1$$

$$\frac{(x^2-4x+x-4) - (3x^2-2x+15x-10)}{x^2+6x+5} = 1$$

$$\frac{-2x^2-16x+6}{x^2+6x+5} = 1$$

$$-2x^2-16x+6 = x^2+6x+5$$

$$0 = 3x^2+22x-1$$

$x = 0.0451762$ or $x = -7.37851$

$x = 0.05$ or $x = -7.38$

(6)