Harder Algebra Worksheet with Answers

$$\frac{\left(\frac{1}{2}\right)^{-2} \times 2^{-2}}{\left(\frac{1}{2}\right)^{0}} = 1 \tag{1}$$

Solve the inequality $-2x^2 + x + 2 \leq 0$

$$x \leq \frac{1-\sqrt{17}}{4} \text{ and } x \geq \frac{1+\sqrt{17}}{4} \tag{2}$$

$$\frac{-4\left(\frac{1}{\sqrt{7}} + \frac{1}{\sqrt{5}}\right)}{\sqrt{7}} = -\frac{4}{7} - \frac{4}{35}\sqrt{35} \tag{3}$$

What is the n-th term in the sequence $7, 13, 27, 49, 79$? $4n^2 - 6n + 9$ (4)

AB=11.74, AC=5.52, ABC=27°. ACB is obtuse. Find the area of triangle ABC. 39.40 (5)

Solve the simultaneous equations

$$\begin{aligned} -4x + 8y &= 1 \\ -x - 2y &= 2 \end{aligned}$$

$$x = -\frac{9}{8}, y = -\frac{7}{16} \tag{6}$$

$f(x) = 3x^2 - x - 3$. Find the turning point of $f(x)$, the roots of $f(x) = 0$ and the turning point of the function $-6f(x-8) + 5$.

$$\left(\frac{1}{6}, -\frac{37}{12}\right),\ x = \frac{1-\sqrt{37}}{6} \text{ or } x = \frac{1+\sqrt{37}}{6},\ \left(\frac{49}{6}, \frac{47}{2}\right) \tag{7}$$

Rearrange to make x the subject in $y = \frac{9-5x}{8-7x}$ $x = \frac{9-8y}{5-7y}$ (8)

$f(x) = -2x + 2,\ g(x) = \frac{1}{-x+3}$. Solve $f(g(x)) = g(f(x))$: $x = \frac{7-\sqrt{65}}{8}$ or $x = \frac{7+\sqrt{65}}{8}$ (9)

$$\frac{2+2\sqrt{3}}{4+\sqrt{7}} = \frac{8+8\sqrt{3}-2\sqrt{7}-2\sqrt{21}}{9} \tag{10}$$

$$4\left(\frac{1}{\sqrt{6}}+\frac{1}{2}\right)^{-1} = -8\sqrt{6}+24 \tag{11}$$

Solve the simultaneous equations

$$x^2+y^2=1$$
$$4x-4y=1$$
$$x=\frac{1-\sqrt{31}}{8}, y=\frac{-1-\sqrt{31}}{8}$$
$$x=\frac{1+\sqrt{31}}{8}, y=\frac{-1+\sqrt{31}}{8} \tag{12}$$

Find the circumcentre of the triangle with vertices

$A=(-2,-2)$, $B=(9,3)$ and $C=(8,8)$: $(\frac{3}{2},\frac{5}{2})$ (13)