**Simplify the following radicals.**

|  |  |  |
| --- | --- | --- |
| $$1) \sqrt{-80}$$ | $$2) -2\sqrt{-72}$$ | $$3) 9i\sqrt{-49}$$ |
| $$4) \sqrt{\frac{-96}{64}}$$ | $$5) \sqrt{\frac{126}{50}}$$ |
| 6) $\sqrt{\frac{-120}{8}}$ | 7) $-5\sqrt{-90}$ |

**Simplify using powers of i:**

|  |  |
| --- | --- |
| $$8) i^{40}+6i^{10}-9i^{20} $$ | $$9) i^{250} $$ |
| $$10) 3i^{27}$$ | $$11) -2i^{100}-3i^{14}$$ |
| $$12) 3i^{22}-7i $$ | $$13) 3i^{272}-16i^{314} $$ |
| $$14)-18i^{57}$$ | $$15) -13i^{55}+5i^{140}+8i^{10}$$ |

**Solve the following quadratic equations.**

|  |  |  |
| --- | --- | --- |
| $$16) 4x^{2}+2=-2$$ | $$17) 2(x^{2}-1)=-6$$ | $$18) (x+1)^{2}=-4 $$ |
| $$19) \frac{2}{3}\left(x-4\right)^{2}=-6$$ | $$20) x^{2}+70=2 $$ |

**Solve for x and y:**

|  |  |
| --- | --- |
| $$21) 6x-4+15yi=-10-30i $$ | $$22) 5\left(x+2\right)+12\left(\frac{1}{2} y\right)i=15x-24yi+4i$$ |
| $$23) 16x+2i-4=20+10yi$$ | $$24) 5y-12+36yi=13+6i$$ |

**Simplify the following expressions.**

|  |  |
| --- | --- |
| $$25) 5i(9-2i)(1-3i)$$ | $$26) \frac{4+6i}{4-3i} $$ |
| $$27) 5\left(-2-3i\right)-(-2+7i)$$ | $$28) \frac{2i}{3+6i}$$ |
| $$29) (7+4i)^{2}$$ | $$30) -2i\left(13+5i\right)-3(14-6i)$$ |
| $$31) -4i(1-6i)(12-2i)$$ | $$32) \frac{6+7i}{1-9i} $$ |
| $$33) -3\left(-5-9i\right)+(-1+7i)$$ | $$34) \frac{15i}{5+10i}$$ |
| $$35) (-8+3i)^{2}$$ | $$36) 2i\left(5+2i\right)-10(11-4i)$$ |