11.2.5

Questions: `#140-143, 152-156, 158-159`

140

$$r\left(\cos(\theta)+i\sin(\theta)\right)=s\left(\cos(\alpha)+i\sin(\alpha)\right)^{n}$$

141

$$\begin{aligned} f\left(1\right) &= x^{3}-1 \\ &= \left(1\right)^{3}-1 \\ &= 1-1 \\ &= 0 \end{aligned}$$

152

$$\left(-2\right)\left(2\right)\left(2\right)\left(2\right)\ \left(2\right)\left(-2\right)\left(2\right)\left(2\right)\ \left(2\right)\left(2\right)\left(-2\right)\left(2\right)\ \left(2\right)\left(2\right)\left(2\right)\left(-2\right)$$

154

$$= \frac{3^{(2+0.001)}-g^{(2-0.001)}}{(2+0.001)-(2-0.001)} \quad \approx 9.89$$

155

$$\frac{13x}{4-x^{2}}+\frac{2}{4-x^{2}}$$

158

$\left\langle\sqrt{2}\right\rangle$, $\left\langle\sqrt{2}\right\rangle$

6.2.1

Questions: `#63-70, 72-75`

Question 63

See resource page.

Question 64

b.

$$\langle 4, -3 \rangle$$

c. 5
d. South East
e. $Q_2 = \langle 2, 4 \rangle$ and $P_2 = \langle 6, 1 \rangle$

Question 65

$$\langle \approx 5.196, -3 \rangle$$

Question 66

$$y = 0.96 = \frac{24}{25}$$

Question 67

$$\vec{\mathrm{n}} = \langle 3, -2 \rangle \, \vec{\mathrm{n_2}} \quad = \langle -3, 2 \rangle \, \vec{\mathrm{n_3}} = \langle -3, -2 \rangle$$

Question 68

$$||\vec{\mathrm{g}}|| = \sqrt{13}\vec{\mathrm{g}} = \langle 3, 4 \rangle$$

Question 70

$$\begin{aligned}
\log_3(x+9) - \log_3(x) + \log_5\left(5^2\right) &= 4 \\
\log_3(x+9) - \log_3(x) + 2 &= \\
\log_3(x+9) - \log_3(x) &= 2 \\
\log_3\left(\frac{x+9}{x}\right) &= 2 \\
3^2 &= \frac{x+9}{x} \\
9 &= \\
9x &= x+9 \\
8x &= 9 \\
x &= \frac{9}{8} \\
x &= 1.125
\end{aligned}$$

Question 71

$$\sum_{n=3}^{11} \frac{1}{n}$$

Question 72

$$\frac{5}{x-2}-\frac{2x+1}{x-3}=\frac{5}{(x-2)}\cdot\frac{(x-3)}{(x-3)}-\frac{(2x+1)}{(x-3)}\cdot\frac{(x-2)}{(x-2)}\quad=\frac{5\,(x-3)}{(x-2)\,(x-3)}-\frac{(2x+1)\,(x-2)}{(x-2)\,(x-3)}=\frac{5\,(x-3)-(}{(x-2}$$

Question 75

a. 2.5
b. 4# 6.2.2

Questions: `#76-94`

Question 78, 80

Graphically, vector addition forms four sided shapes, with a line connecting opposite angles.

This is the *Parallelogram Law of Vector Addition* which says that vectors can form two adjacent sides of a parallelogram, where the diagonal of said parallelogram is the resultant.

Question 81

if $\vec{a} = <3, 1>$ then:

$$\vec{A} = \langle -3, -1 \rangle$$

Question 82

a.
$$\vec{u} = \langle 4, -3 \rangle$$

b.
$$||\vec{u}|| = \sqrt{4^2 - 3^2} = 5$$

c.
$$5\vec{u} = \langle 20, -15 \rangle$$

d.
$$||5\vec{u} = \sqrt{20^2 + (-15)^2} = 25 = 5\,(5)$$

e.
$$||k\vec{u}|| = k||\vec{u}||$$

Question 84

a. $6i - 2$
b. 2

Question 85

No, in the first case it becomes the magnitude of the resultant vector.

Question 87

a. $8 - 4i$
b. $4 - 2i$

Question 88

a.

$$\sqrt{18}$$

b.

$$10$$

Question 94

a. $x = 4$
b. $x = -2, 2$