**EE381 HW 4**

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3.5

All work done in Python. For vector notation, I use $[a, b, c]$ instead of $\hat{x}a + \hat{y}b + \hat{z}c$.

**(a)**

$|A| = 3.742$, $\hat{\mathbf{a}} = [0.267, 0.535, -0.802]$

**(b)**

$comp_C B = -1.789$

**(c)**

$\theta_{AC} = 17.0°$

**(d)**

$\mathbf{A} \times \mathbf{C} = [-2, 4, 2]$

**(e)**

$\mathbf{A} \cdot (\mathbf{B} \times \mathbf{C}) = 20$

**(f)**

$\mathbf{A} \times (\mathbf{B} \times \mathbf{C}) = [32, -52, -24]$

**(g)**

$\hat{\mathbf{x}} \times \mathbf{B} = [0, 0, -4]$

**(h)**

$(\mathbf{A} \times \hat{\mathbf{y}}) \cdot \hat{\mathbf{z}} = 1$

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3.14

What is this question even asking?

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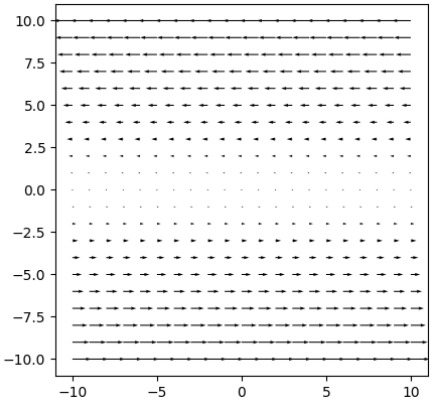
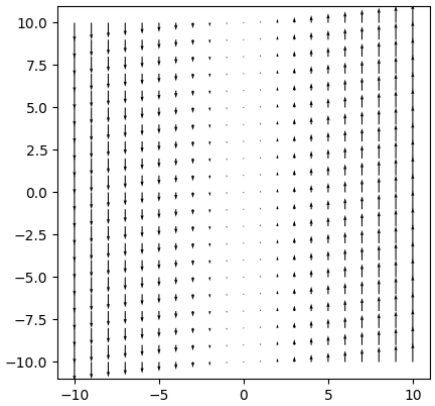
3.20

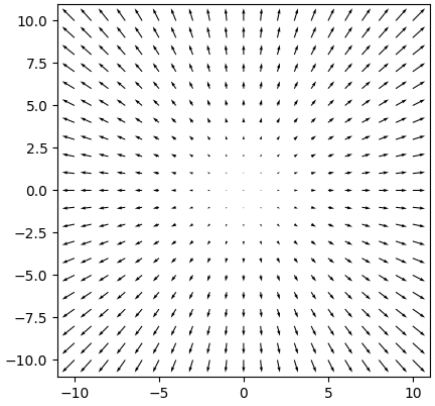
**(a)**



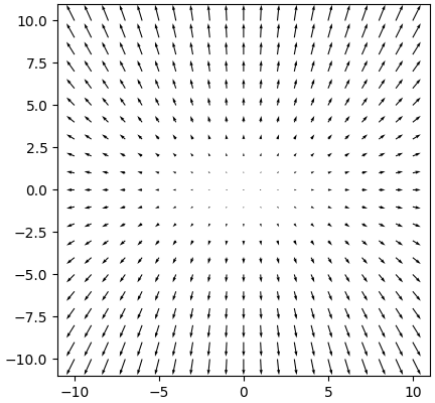

**(b)**



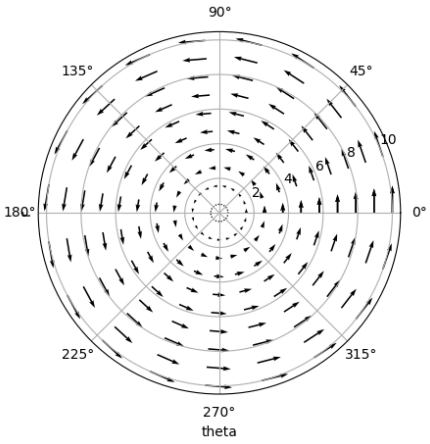

**(c)**



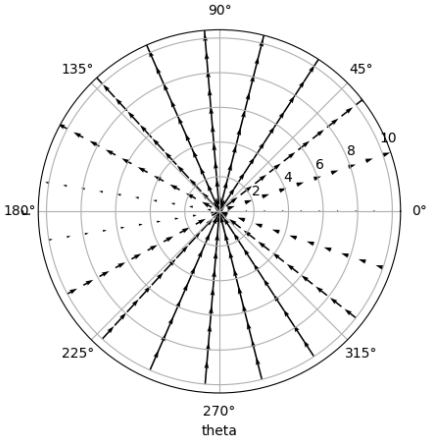

**(d)**



**(e)**




**(f)**

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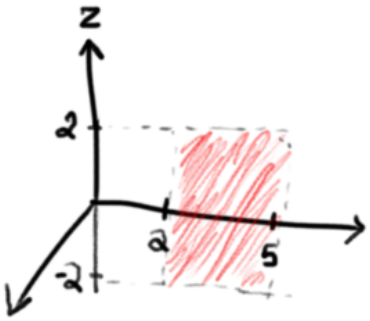
3.25

**(c)**

```
import scipy.integrate as integrate
import numpy

rRange = (2, 5)
zRange = (-2, 2)
A = integrate.dblquad(
    lambda r, z: 1,
    *rRange,
    *zRange)
print(f"\(A = \\boxed{{ {A[0]} }}\)")
```

$A = \boxed{12.0}$

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3.26

```
import scipy.integrate as integrate
import numpy

rRange = (2, 5)
phiRange = (numpy.pi/2, numpy.pi)
zRange = (0, 2)
volume = integrate.tplquad(
    lambda z, phi, r: r,
    *rRange,
    *phiRange,
    *zRange)[0]
print(f"\(V = \\boxed{{ {volume/numpy.pi}\pi }}\)")
```

$V = \boxed{10.5\pi}$

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3.40

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3.44

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3.48

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3.50